

TELETYPE

PRINTING TELEGRAPH SYSTEMS

ADJUSTMENTS

REPERFORATOR TRANSMITTER DISTRIBUTOR

(NONTYPING — FULLY PERFORATED TAPE)

(FRXD3)

REPERFORATOR TRANSMITTER DISTRIBUTOR

(TYPING — CHADLESS TAPE)

(FRXD4)





REPERFORATOR TRANSMITTER DISTRIBUTOR WITH COVER
(NON-TYPING FRXD3)



REPERFORATOR TRANSMITTER DISTRIBUTOR WITH COVER
(TYPING FRXD 4)



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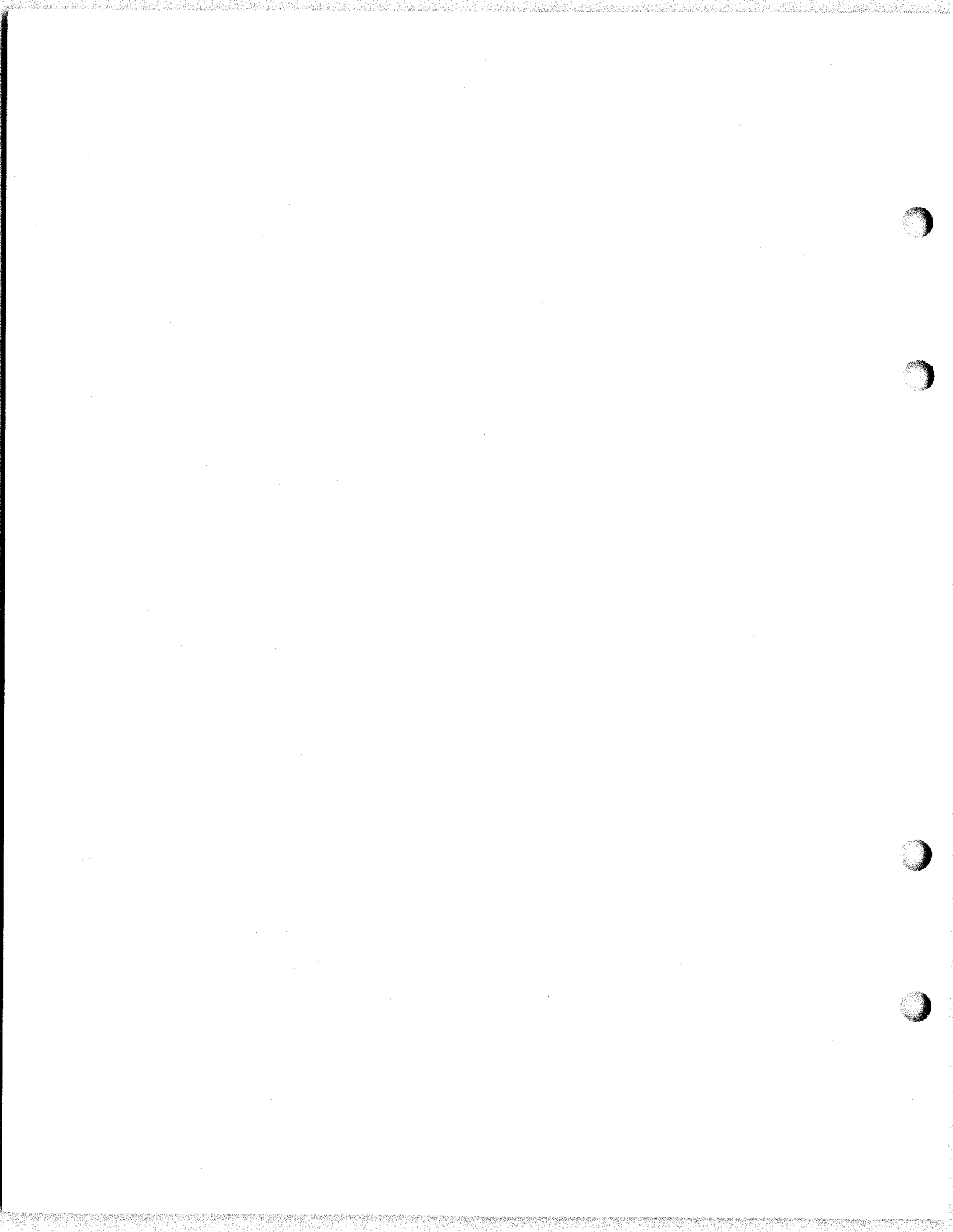
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ADJUSTMENTS

GENERAL

The following adjustments cover two types of REPERFORATOR TRANSMITTER DISTRIBUTORS. The adjustments that are special to either type of unit will have the titles of those specific adjustments identified by one or two asterisks, as follows:

- * Adjustments that apply to the FRXD3 unit, which is nontyping and produces a fully perforated tape.
- ** Adjustments that apply to the FRXD4 unit, which is equipped with typing mechanism and produces chadless tape.

This bulletin contains the requirements and adjusting procedures for the maintenance of REPERFORATOR TRANSMITTER DISTRIBUTORS. Adjustments are arranged in a sequence that would be followed if a complete readjustment of a unit were undertaken. In following such a procedure, parts and assemblies which are removed to facilitate adjustments should not be replaced until other adjustments are made which would be facilitated by the removal of these parts. If one adjustment is changed, related adjustments should be checked because a change in one adjustment may affect related adjustments. These facts should be kept in mind when a single adjustment is to be made.

The spring tension values given in this bulletin are scale readings which should be obtained when Teletype scales are used as specified. Springs which do not meet the requirements specified and for which no adjusting procedure is given should be replaced by new springs. Ordering information may be obtained from the Teletype parts bulletin.

Before proceeding to adjust any part, read the description of the adjustment carefully. After the adjustment is completed, be sure to tighten any screws or nuts which may have been loosened. If a part that is mounted on shims is to be removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-up can be replaced when the part is remounted.

SELECTING A CHARACTER OR FUNCTION

When the instructions for making an adjustment specify the SETTING UP of a certain character or function, the following method should be followed: Rotate the motor fan or governor counterclockwise, as viewed from the fan or governor end, until the locking lever (See Figure 5) is about to drop off the long high part of the locking cam. Hold or release the selector armature to move the selector arm extension to the operated (MARKING) or unoperated (SPACING) side in accordance with the first selecting impulse of the code combination to be set up. Refer to the code chart (Figure 1). Hold the selector arm extension in this position and again rotate the motor fan or governor until the top (No. 1) selector sword has been positioned and the locking lever is on the peak of the locking cam. Position the selector arm extension in accordance with the second impulse of the code combination to be

set up and repeat the procedure followed in positioning the top (No. 1) selector sword. Position all of the selector swords following the foregoing procedure. When all swords have been positioned and the main shaft clutch has been engaged, further rotation of the motor fan or governor will cause the unit to select the character or to perform the functions which have been SET UP.

SPEED SETTING

When governed motors are used, a tuning fork is required for the purpose of checking the motor speed. The fork is equipped with shutters attached to the end of the tines. The governor is equipped with a target having alternate black and white spots (Figure 80).

To check speed, the target should be well illuminated. Tap the fork lightly to make it vibrate. Hold the fork so that the shutters are close to the eye and view the target through the openings in the shutters. If the motor is running at the correct speed, the target will appear to be stationary. If the motor is running too fast, the spots will appear to be moving in the direction of motor rotation; if too slow, in the opposite direction. To increase the speed, hold the speed adjusting lever (Figure 80). To decrease the speed, operate the governor adjusting lever (Figure 80).

NOTE: There is a possibility of setting the speed incorrectly, due to getting a speed multiple; i.e., the speed could be half the desired speed, or two-thirds the speed, or some other multiple, even though the spots appear to be stationary when viewed through the speed indicator shutters. This should be kept in mind if trouble is experienced in the operation of the unit.

TO MEASURE RECEIVING RANGE

Mounted on the selector mounting plate above the top end of the main shaft of the printer is the range finder assembly which is used for the purpose of orientating the selector to the incoming signals. Transmit RY (the letters RY sent alternately) to the printer continually while the receiving range is being determined. The range may be taken as follows:

While RY is being received, loosen the index arm thumb screw (Figure 13) and shift the index arm of the range finder toward 0 until errors appear in the copy. Then move the arm back slowly until errors no longer appear; at least 72 characters should be received without error. This position indicates one limit of the orientation range. Note the position of the index arm on the scale. Determine the opposite end of the receiving range by repeating the foregoing procedure with the index arm near the opposite end of the scale. After the two limits of the receiving range have been found, set the index arm of the range scale midway between these two points.

NOTE: If facilities for transmitting biased test signals to the receiving unit are available, the index arm should be set at the optimum setting for the reception of biased signals.

TO MOVE THE MOTOR UNIT

To facilitate some adjustments, the motor unit should be swung out in the following manner. Remove the right-hand and the rear left-hand motor unit base plate mounting screws, loosen the left-hand front mounting screw, and swing the motor unit, tape reel and relay assembly to the left. When replacing the motor unit, make sure that the motor pinion is meshed with the gear on the main shaft and make sure that the base plate is resting against the eccentric stop on the right-hand side.

NOTE: When moving the motor unit on which the relay assembly and tape reel assembly are mounted, care should be taken so as not to damage the tape-out contacts or the cables.

Before proceeding to adjust the unit, it will be necessary to remove the following: **Ribbon and Ribbon spools, Base Plate, Tape Chute, *Baffle Plate, Transmitting Contacts Cover Plate, Sensing Shaft Cover Plate, *Lower Chad Chute and Gear Guard.

MAIN SHAFT CLUTCH SPRING TENSION (Figure 2)

With the teeth of the driven clutch member resting against the teeth of the driving clutch member, but not engaged, place the unit so that it is resting on its rear supports and insert the pull end of a 32 oz. scale through the cable hole in the base casting to the right of the main shaft. Hook the pull end of the scale over the throwout cam on the driven clutch member and pull as nearly in line with the shaft as possible. It should require 24 to 30 ozs. to separate the clutch teeth.

SELECTOR SEPARATOR PLATE ADJUSTMENT (Figure 3)

NOTE: The separator plate leaf springs are adjusted during the initial assembly of the unit and should require attention only if the selector has been damaged or dismantled. If it is found necessary to check the adjustment, extreme care should be exercised in the removal and displacement of the selector lever springs to guard against distorting them. The subsequent selector adjustments will be facilitated if the swords and selector levers are replaced in the identical positions they formerly occupied.

The leaf springs should exert a light pressure against the swords. To adjust, bend the leaf springs at the narrow portions so that the ends of the springs are .050" to .060" below the under surface of the straight portions.

MAIN SHAFT ADJUSTMENT

The cams on the selector cam sleeve should line up with their associated selector levers. To check alignment, rotate the selector cam sleeve at least one complete revolution. To adjust, loosen the four screws

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* FRXD3 only
** FRXD4 only

that hold the main shaft bearing caps (Figure 4) and set the position of the main shaft. Tighten the screws.

MAIN SHAFT CLUTCH THROWOUT LEVER ADJUSTMENT (Figure 4)

The clutch throwout lever should be free on its bearing with no perceptible end play and there should be .010" to .020" clearance between the ends of the clutch teeth when the members are fully disengaged. To adjust, position the clutch throwout lever upper pilot screw and adjust the lower pilot screw so that the clutch throwout lever is free with no perceptible end play when the pilot screw locknuts are tightened.

MAIN SHAFT CLUTCH THROWOUT LEVER SPRING TENSION (Figure 4)

With the clutch throwout lever resting against the lower surface of the driven clutch member, hook an 8 oz. scale over the clutch throwout lever at the spring hole and pull horizontally at right angles to the clutch throwout lever. It should require 2-1/2 to 4 ozs. to start the lever moving.

MOTOR POSITION AND GEAR MESH ADJUSTMENT

There should be a barely perceptible amount of backlash between the motor pinion and the highest point of the main shaft gear. The lateral alignment of the motor pinion and the main shaft gear should be such that the center line of the gear coincides with a vertical line through the center of the hole in the motor pinion. To adjust, remove the gear guard and set the motor base plate eccentric stop in the center of its adjustment. Position the base plate against the stop. Then, by means of shims between the motor feet and the base plate, align the center of the motor pinion with the center line of the gear using the same number of shims under each foot. At the same time, position the motor in its elongated mounting holes for proper play. The shims not used under the motor feet should be retained beneath their respective mounting screw lock washers to prevent the screws from protruding beneath the base plate. The gear play can be refined by pivoting the motor base plate about the left-hand screw and readjusting the eccentric stop.

REMOVE THE RANGE FINDER ASSEMBLY

ARMATURE PIVOT SCREW ADJUSTMENT (Figure 5) See Note (A)

With the armature spring and the selector arm spring unhooked, the armature should be free on its pivots with barely perceptible end play. To adjust, loosen the pivot screw locknuts and position by means of the pivot screw. Tighten the lock nuts.

SELECTOR MAGNET ADJUSTMENT (Figure 6) See Note (A)

The armature, when in its operated position, should touch both magnet cores at approximately the centers of their pole faces and the cores should be

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(A) This requirement should be checked with the range finder assembly removed.

centrally located with respect to the armature as gauged by eye when holding a light background behind the magnet and armature assembly. To adjust, remove the selector magnet bracket from the unit and reposition the magnet core assembly so that the cores are vertical and the armature, by its own weight, rests against the pole faces. Replace the selector magnet bracket.

NOTE: When the cores are in proper adjustment, it should require at least 3-1/2 lbs. when the pull end of a 4-lb. scale is applied at right angles to the armature edge in a line with the armature extension, to separate the armature from the cores when a current of .020 amperes is flowing through the magnet coils (coils in series shunted by 5000 ohm resistance).

SELECTOR ARM PIVOT SCREW ADJUSTMENT (Figures 7 and 8) See Note (A)

With the armature spring, the selector arm spring and the selector arm detent spring unhooked, the selector arm should be free on its pivots with barely perceptible end play, and the locking lever should overtravel the top and bottom edges of the locking wedge. There should also be a minimum clearance of .008" between the selector arm and the armature extension, and a minimum clearance of .010" between the selector arm and the selector arm stop detent when the play in the detent is taken up in a direction to make this clearance a minimum. The end play may be adjusted by means of the upper pivot screw. If the minimum clearance requirements are not met, it will be necessary to remove the selector magnet bracket and the selector arm bracket and adjust both pivot screws of the selector arm.

SELECTOR ARM BRACKET ADJUSTMENT (Figure 5) See Note (A)

The position of the selector arm bracket should be such as to provide some clearance, not more than .040", between each sword and either stop post under the following conditions:

Remove the locking lever spring, the armature spring, and the selector arm spring. Rotate the main shaft until the No. 1 selector lever is resting on the peak of its cam. With the selector arm in its unoperated SPACING position, move the spacing arm of the No. 1 sword against the selector arm. Then rotate the selector arm slowly toward the MARKING position until the selector arm just leaves the spacing arm of the No. 1 sword. There should be some clearance, not more than .040", between the No. 1 sword and spacing stop post.

With the selector arm in its operated MARKING position, move the marking arm of the No. 1 sword against the selector arm. Then rotate the selector arm slowly toward the SPACING position until the selector arm extension just leaves the marking arm of the No. 1 sword. There should be some clearance, not more than .040", between the No. 1 sword and the marking stop post.

* * *

(A) This requirement should be checked with the range finder assembly removed.

With each selector lever on the peak of its cam, each associated sword should be tried for the foregoing requirement of some clearance, not more than .040". To adjust, loosen the selector arm bracket mounting screws just enough to make the bracket friction tight. Then, to equalize the clearance between the swords and the stop posts, loosen the centralizing eccentric screw lock nut and turn the eccentric screw clockwise to provide more clearance on the spacing side or counterclockwise to provide more clearance on the marking side.

NOTE: Be sure that the selector arm stop detent does not interfere with the adjustment.

The centralizing eccentric screw should always be located so that its indicating line is adjacent to the marked scale that has been provided on the bracket to aid in gauging the amount the screw must be turned. Tighten the lock nut when the selector arm has been centralized. To obtain the **SOME CLEARANCE, NOT MORE THAN .040"** requirement between the swords and the stop posts, insert the 90783 adjusting wrench in one of the two holes provided and turn the wrench to move the bracket closer or farther from the swords as required. Then tighten the selector arm bracket mounting screws. Replace the locking lever spring, selector arm spring, and the armature spring.

LOCKING WEDGE ADJUSTMENT (Figure 9) See Note (A)

With the locking lever on the high part of its cam, the front end of the locking wedge should clear the locking lever by .006" to .010" when the end of the wedge is held in line with the locking lever. To adjust, loosen the locking wedge mounting screw and position the locking wedge in its guide. Tighten the mounting screw.

LOCKING LEVER SPRING TENSION (Figure 9) See Note (A)

With the locking lever on the high part of its cam, hook an 8 oz. scale on the end of the locking lever at the spring hole and pull in line with the spring. It should require 4 to 5-1/2 ozs. to start the lever moving away from its cam.

SELECTOR ARM STOP DETENT ADJUSTMENT (Figure 8) See Note (A)

With the locking lever on the low part of its cam, there should be an equal amount of clearance, within .003", between the sides of the locking wedge and the locking lever when the selector arm is in the MARKING or SPACING position.

NOTE: When checking the MARKING position, be sure that the selector arm operating screw does not interfere with the movement of the selector arm.

To adjust, loosen the screw that mounts the selector arm stop detent eccentric post just enough to make the post friction tight. Position the stop detent by turning the post. Tighten the post mounting screw.

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(A) This requirement should be checked with the range finder assembly removed.

SELECTOR ARM STOP DETENT SPRING TENSION (Figure 8) See Note (A)

Unhook the stop detent spring from the locking lever guide and hook an 8 oz. scale in the spring eye. It should require 4 to 5 ozs. to pull the spring to its position length.

SELECTOR LEVER SPRING TENSION (Figure 9) See Note (A)

With the code bars in the MARKING position and the main bail in its highest position, move the swords manually to the SPACING POSITION. Hook a 32 oz. scale over the end of each selector lever at the selector cam sleeve and pull radially to the main shaft. It should require 6 to 10 ozs. to start each selector lever moving.

NOTE: When checking the tension of the selector lever springs, make sure that the selector levers are free and without binds.

SELECTOR MAGNET BRACKET POSITION ADJUSTMENT (Figure 10) See Note (A)

With the main shaft in the stop position, rotate the selector cam sleeve until the locking lever just drops off the high part of its cam; then rotate the cam sleeve backwards until rotation is stopped by the locking lever. There should be a clearance of .060" to .065" between the armature extension and the face of the tooth on the armature cam. To adjust, loosen the selector magnet bracket mounting screws just enough to make the bracket and adjusting arm friction tight. Then position the selector magnet bracket by means of the adjusting arm, using the 90783 adjusting wrench. To do this, insert the adjusting wrench in the hole above the end of the adjusting arm and rotate the wrench. Tighten the bracket and the adjusting arm mounting screws.

NOTE: When checking this requirement, the armature lever shall be held approximately .045" from the bottom of the notch of its cam.

SELECTOR MAGNET BRACKET ADJUSTMENT (Figure 6) See Note (A)

NOTE: When making this adjustment, the selector arm should be kept in the MARKING position.

With the selector magnet energized, the clearance between the selector arm operating screw and the selector arm should be .004" to .006" greater when the armature extension is on the peak of the armature cam than when the armature extension is opposite an indent of the cam.

- (1) To adjust, de-energize the magnet and rotate the selector cam sleeve until the armature extension is resting on a peak of the armature cam. Holding the cam sleeve in this position, turn the main shaft to a point where it moves the armature extension the greatest distance.

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- (A) This requirement should be checked with the range finder assembly removed.

- (2) With the selector magnet still de-energized, loosen the selector magnet bracket mounting screws, and, by means of its adjusting screw, rotate the selector magnet bracket so that the armature just touches the pole faces; then turn the adjusting screw an additional one-tenth of a turn counterclockwise. This will press the armature firmly against the magnet cores. (While making the one-tenth of a turn adjustment, be careful to avoid lost motion due to loose fitting screw threads).
- (3) With the selector magnet energized, measure the clearance between the selector arm operating screw and the selector arm and, if there is no clearance, back off the selector arm operating screw to provide at least .006" clearance. Then rotate the selector cam sleeve so that the armature extension is opposite an indent of the armature cam and again measure the clearance between the selector arm operating screw and the selector arm. If the difference in the two clearances exceeds .006", the selector magnet bracket adjusting screw should be turned clockwise. If the difference in the clearance is less than .004", turn the screw counterclockwise. Tighten the selector magnet bracket mounting screws.

ARMATURE SPRING TENSION ADJUSTMENT (Figure 6) See Note (A)

Unhook the armature spring from its spring arm and rotate the main shaft until the armature extension is on the high part of the armature cam. With a 32 oz. scale hooked in its spring eye, pull the spring to its position length. It should require the following spring tensions:

- (A) If a distortion test set is available, the spring tension should be set at the optimum value within the limits of 13 to 24 ozs. when range is being checked.
- (B) If no distortion test set is available, the spring tension should be 17 to 19 ozs., except when the coils are connected in parallel without a 1000 ohm shunt. Under this latter condition the tension should be 13 to 15 ozs.

To adjust, loosen the spring arm mounting nut and position the spring arm. Then tighten the mounting nut. Recheck the armature spring tension.

SELECTOR ARM OPERATING SCREW ADJUSTMENT (Figure 11) See Note (A)

With the selector magnet energized and the selector cam sleeve rotated so that the armature extension is opposite an indent of the armature cam, there should be a clearance of .003" to .006" between the selector arm operating screw and the selector arm. To adjust, loosen the selector arm operating screw lock nut and position the screw. Tighten the lock nut.

* * *

- (A) This requirement should be checked with the range finder assembly removed.

SELECTOR ARM SPRING TENSION (Figure 12) See Note (A)

Unhook the selector arm stop detent spring. With the armature extension on the high part of its cam and the locking lever held away from the locking wedge, hook an 8 oz. scale over the end of the locking wedge and pull parallel to the selector arm spring. It should require 1-1/4 to 1-3/4 ozs. to start the selector arm moving. Replace the detent spring.

STOP LEVER ECCENTRIC SCREW ADJUSTMENT (Figure 13) See Note (A)

The stop lever on the range finder assembly should overtravel the latching face of the trip latch by not more than .006". To adjust, loosen the stop lever eccentric screw lock nut and position the eccentric screw; then tighten the lock nut, making certain that the tightening of the lock nut does not disturb the adjustment.

TRIP LATCH SPRING COMPRESSION (Figure 13) See Note (A)

When measuring this requirement, the range finder assembly should be held in a horizontal position. Apply the push end of an 8 oz. scale, held in a vertical position, to the trip latch as near to the stop lever as possible. It should require 1 to 1-1/2 ozs. to start the trip latch moving.

STOP LEVER SPRING TENSION (Figure 14) See Note (A)

NOTE: Be sure that the stop lever eccentric screw has been adjusted before checking this requirement.

With the trip latch plunger held operated, hook an 8 oz. scale on the end of the stop lever of the range finder assembly to pull horizontally at right angles to the stop lever. It should require 3/4 to 1-1/4 ozs. to start the lever moving.

REPLACE THE RANGE FINDER ASSEMBLY, TAKING CARE TO AVOID JAMMING THE TRIP LATCH PLUNGER AGAINST THE ARMATURE TRIP-OFF SCREW AND MAKING SURE THAT THE ROUND TIP OF THE CLUTCH RELEASE LEVER IS UNDER THE TRIP LATCH PLUNGER AND BETWEEN THE TRIP LATCH BELL CRANK AND ITS BRACKET. (See Figures 13 and 16)

TRIP-OFF SCREW ADJUSTMENT (Figure 15)

There should be some clearance, not more than .002", between the stop lever and the trip latch when the armature is in the unoperated position and the selector cam sleeve is rotated until the stopping edge of the stop lever is below the latching surface of the trip latch.

The trip latch plunger should have at least .002" end play (See Figure 13) when the armature is held in the attracted position with the stop lever against its eccentric screw.

* * *

(A) This requirement should be checked with the range finder assembly removed.

To adjust, loosen the trip-off screw lock nut (Figure 15) and position the screw to meet the first requirement. The latter requirement serves as a check on the trip-off screw adjustment and also on the adjustment of the selector magnet bracket.

MANUAL TAPE-OUT MECHANISM ADJUSTMENT (Figure 16)

- (1) The round tip of the clutch release lever should be under the trip latch plunger and between the trip latch bell crank and its bracket. The clutch release lever should not limit the upper range movement of the indicator arm on the range finder scale assembly. To adjust, loosen the set screws in the clutch release lever set collar and position the lever by means of the set collar. Tighten the set screws.
- (2) The clutch release rod should slide freely on its shoulder screw. To adjust, loosen the lock nut on the front shoulder screw and position the screw. Tighten the lock nut.
- (3) It should require 2-3/4 to 3-3/4 ozs. to start the clutch release rod moving when the push end of an 8 oz. scale is applied to the end of the push rod and is pushed parallel to the rod.

PULL BAR GUIDE ADJUSTMENT (Figure 17B) *

There should be .004" to .080" clearance between the end of the No. 1 T lever and the bottom of the slot in the code bar measured at the point of closest approach. Also see that there is some clearance between the ends of the Nos. 2, 3, 4, and 5 T levers and their respective code bars measured at the point of closest approach. To meet this requirement, position the pull bar guide in its elongated mounting holes by means of the mounting screws. Tighten the mounting screws.

MAIN BAIL ADJUSTING SCREW PRELIMINARY ADJUSTMENT See Note (B) *

NOTE: MAIN BAIL ADJUSTING SCREW FINAL ADJUSTMENT is on Page No. 21.

With the main bail roller on the high part of its cam (Figure 4) there should be a clearance of .060" to .080" between the main bail and the upper left extension of the main bail bracket at the point of closest approach. To adjust, loosen the lock nut; position the main bail adjusting screw (Figure 4). Tighten the lock nut.

MAIN BAIL GUIDE ADJUSTMENT See Note (B) *

Loosen the mounting screws on the two main bail guides (Figure 18). Position the left guide in the middle of its adjustment and tighten the mounting screws. Remove the main bail spring (Figure 4). Position the right

* * *

- * FRXD3 only
- (B) When positioning the main bail adjusting screw or removing the main bail spring, it will facilitate the adjustment or removal if the motor unit is pivoted to the left.

main bail guide so that the main bail (Figure 4) will fall to its down position of its own weight when manually raised to its uppermost position and released. Tighten the mounting screws. When finally adjusted, the main bail should not bind in any position of its stroke. Replace the main bail spring.

INSTRUCTIONS FOR REMOVING THE TYPE BASKET ASSEMBLY **

NOTE: In order to measure the tension of the pull bar springs or to adjust the function bar spring brackets, it will be necessary to remove the type basket assembly.

- (1) Unhook the code bar locking lever, the letters pull bar, and the space pull bar springs.
- (2) Remove the three mounting screws from the code punch bracket assembly.
- (3) Remove the distributor shaft and sensing shaft clutch detent lever bracket assembly by removing its two mounting screws.
- (4) Remove the three type basket assembly mounting screws.
- (5) Unhook the punch bail arm spring.
- (6) Remove the ribbon spools and ribbon.
- (7) Remove the code punch block assembly rear mounting screw.
- (8) Remove the front mounting screw of the right-hand ribbon spool bracket. Loosen the rear mounting screw and swing the bracket so that the ribbon spool cup will not interfere with the removal of the type bar basket assembly.
- (9) Lift out the code punch bracket assembly with the code punch block assembly attached.
- (10) Then, with the pull bars held out of engagement of the pull bar guide, (use a piece of string or wire) slide the type bar basket upward and out of the unit.

FUNCTION BAR SPRING BRACKETS ADJUSTMENT (Figure 19) See Note (C) **

The pull bars supported by the function bar spring brackets should be free and without binds and they should have approximately equal clearance between the corresponding edges of the function bar spring brackets. Adjust both the right and left function bar brackets by rotating them on their mounting screws.

* * *

** FRXD4 only.

(C) This adjustment should be checked with the type bar basket removed.

PULL BAR SPRING TENSION (Figure 20) See Note (C) **

Unhook the spring from each pull bar. With an 8 oz. scale held in a vertical position, hook the scale in the spring eye. It should require 3 to 4 ozs. to extend any pull bar spring (having associated type bar) to its position length and 5-1/2 to 6-3/4 ozs. to extend any pull bar spring (without associated type bars) to its position length.

NOTE: For adjustment of the pull bar springs that are attached to either the right or left function pull bar brackets, see SPACE or CODE BAR LOCKING LEVER SPRING TENSION on Page 17 or 18.

IF THE TYPE BASKET HAS BEEN REMOVED FOR CHECKING THE FOREGOING REQUIREMENTS, IT SHOULD NOW BE REPLACED BY REVERSING THE PROCEDURE FOLLOWED IN REMOVING IT.

MAIN BAIL GUIDE ADJUSTMENT See Note (B) **

The main bail should be free throughout its travel and the main bail guides (Figure 18) should be positioned so that the requirements specified in the following adjustments can be met:

PULL BAR GUIDE ADJUSTMENTS (Figure 17) Page 13 **

MAIN BAIL ADJUSTING SCREW PRELIMINARY ADJUSTMENT (Figure 4) Page 13**

MAIN BAIL ADJUSTING SCREW FINAL ADJUSTMENT (Figure 40) Page 21

To determine freeness, position the main shaft so that the main bail (Figure 4) is in its uppermost position and remove the main bail spring (Figure 4) and hold the ribbon feed lever roller (Figure 28) away from the main bail plunger. The main bail should fall to its lower position of its own weight. If the main bail is free, the position of the guides need not be checked unless difficulty in meeting the requirements of the aforementioned adjustments are encountered.

To adjust the main bail guides, proceed as follows:

- (1) Position the pull bar guide (code bar mounting plate) so that it is in the middle of the adjustment provided by its elongated mounting holes and loosen both mounting screws of each main bail guide. See Figure 18.
- (2) With the BLANK combination set up and the main bail opposite the humps on the unselected pull bars, position the main bail guides so that the clearance between the main bail and the LETTERS and FIGURES pull bar humps is approximately equal. Tighten the upper mounting screws of the right-hand guide so that the guide is friction tight. See Figure 18A.

* * *

** FRXD4 only.

- (B) When positioning the main bail adjusting screw or removing the main bail spring, it will facilitate the adjustment or removal if the motor unit is pivoted to the left.
- (C) This adjustment should be checked with the type bar basket removed.

- (3) With the main bail roller on the high point of its cam, shift the main bail guides, if necessary, so that the clearance between the code bars and the LETTERS and FIGURES pull bars is approximately equal. (It may be necessary to advance the main bail adjusting screw (Figure 4) to obtain the clearance between the pull bars and code bars). Tighten the lower mounting screw of the right-hand main bail guide friction tight. See Figure 18B.
- (4) Recheck adjustment No. 2 and fully tighten both mounting screws of the right-hand guide after making any necessary readjustments.
- (5) Remove the main bail spring (Figure 4) and hold the ribbon feed lever roller (Figure 28) away from the main bail plunger and position the left-hand main bail guide so that the main bail is free throughout its travel. After tightening the mounting screws of the left-hand main bail guide, check the freeness of the main bail by raising it to its uppermost position manually and releasing it. It should fall to its lower position of its own weight. Replace the main bail spring.

PULL BAR GUIDE ADJUSTMENT (Figure 17) **

- (1) With the BLANK combination set up, there should be .008" to .020" clearance between the unselected pull bars and the main bail when the main bail is opposite the pull bar hump and the play of the main bail is taken up in a direction to make this clearance a minimum. With the LETTERS combination set up, there should be .008" to .020" clearance between the main bail and the blank pull bar.
- (2) There should be .004" to .080" clearance between the end of the No. 1 T lever and the bottom of the slot in the code bar measured at the point of closest approach. Also see that there is some clearance between the ends of Nos. 2, 3, 4, and 5 T levers and their respective code bars measured at the point of closest approach.

To meet these requirements, adjust the position of the pull bar guide by means of its mounting screws.

MAIN BAIL ADJUSTING SCREW PRELIMINARY ADJUSTMENT (Figure 4) ** (See Note B)

NOTE: MAIN BAIL ADJUSTING SCREW FINAL ADJUSTMENT is on Page 21.

When the BLANK and LETTERS combinations are set up in turn and the main bail roller is on the high part of its cam, there should be .010" to .050" clearance between the unselected pull bars and the inner edges of the code bars when the play in the main bail and the pull bars is taken up in a direction to make this clearance a minimum. To adjust, loosen the lock nut and position the main bail adjusting screw. Tighten the lock nut.

* * *

** FRXD4 only.

- (B) When positioning the main bail adjusting screw or removing the main bail spring, it will facilitate the adjustment or removal if the motor unit is pivoted to the left.

RIBBON SPOOL CUPS ADJUSTMENT (Figure 21) **

- (1) The center of the left ribbon roller should be 5-7/16" to 5-9/16" from the surface of the boss on which the pivoted sensing unit mounts. To adjust, position the ribbon spool by means of its lock nut.
- (2) The center of the right ribbon roller should be 4-11/16" to 4-13/16" from the surface of the boss on which the code punch assembly is mounted. To adjust, position the ribbon spool cup by means of its lock nut.

RIGHT RIBBON SPOOL BRACKET ADJUSTMENT **

The right spool cup should be in line with the left spool cup and there should be a minimum amount of backlash between the bevel gear (Figure 23) on the right-hand ribbon spool shaft and the bevel gear (Figure 27) on the ribbon feed shaft throughout a complete revolution of the right ribbon spool shaft when the ribbon feed shaft is in its extreme right position. To adjust, position the right ribbon spool bracket.

LEFT RIBBON SPOOL BRACKET ADJUSTMENT **

The left spool cup should be in line with the right spool cup and there should be a minimum amount of backlash between the bevel gear (Figure 22) on the left ribbon drive shaft and the bevel gear on the left end of the ribbon feed shaft throughout a complete revolution of the left ribbon shaft when the ribbon feed shaft is in its extreme left position. To adjust, position the left ribbon spool bracket.

LEFT RIBBON SPOOL SHAFT ADJUSTMENT (Figure 22) **

The left ribbon spool shaft should have some end play, not over .004". To adjust, position the left ribbon spool shaft gear, locating it so that the set screw engages the flat on the shaft.

LEFT RIBBON SPOOL DRIVE SHAFT ADJUSTMENT (Figure 22) **

The left spool drive shaft should have some end play, not over .004", and the shaft should protrude approximately the same distance through the bevel gear as it does through the front of the ribbon spool bracket. To adjust, position the bevel gear, locating it so that the set screw engages the flat on the shaft.

LEFT RIBBON SPOOL DRIVE SHAFT DRIVING GEAR ADJUSTMENT (Figure 22) **

The left ribbon spool drive shaft driving gear should line up and mesh fully with the intermediate gear. To adjust, position the driving gear.

NOTE: The intermediate gear should have some end play and should rotate freely when meshed with the driving gear and ribbon spool shaft gear.

* * *

** FRXD4 only.

LEFT RIBBON REVERSE ARM SHAFT ADJUSTMENT (Figure 22) **

- (1) The front end of the left ribbon reverse arm shaft should be flush with the front of the ribbon spool bracket when the left ribbon reverse arm is held against the bracket. To adjust, loosen the left ribbon reverse arm set screw and position the shaft. Tighten the set screw.
- (2) The left ribbon reverse arm shaft should have some end play, not more than .004". To adjust, loosen the set screw in the collar and position the collar. Tighten the set screw.

RIGHT RIBBON SPOOL SHAFT ADJUSTMENT (Figure 23) **

The right ribbon spool shaft should have some end play, not more than .004". To check or change this adjustment, shift the ribbon feed shaft, if necessary, to avoid interference between the ribbon feed shaft gear and the ribbon spool shaft gear. To adjust, position the ribbon spool shaft bevel gear, locating it so the set screw engages the flat on the shaft.

RIGHT RIBBON REVERSE ARM SHAFT ADJUSTMENT (Figure 24) **

- (1) The front end of the right ribbon reverse arm shaft should be flush with the front end of the right ribbon spool bracket when the right ribbon reverse arm is held against the bracket. To adjust, loosen the right ribbon reverse arm set screw and position the shaft. Tighten the set screw.
- (2) The right ribbon reverse arm shaft should have some end play, not more than .004". To adjust, loosen the set screw in the collar and position the collar. Tighten the set screw.

RIBBON SPOOL SHAFT COMPRESSION SPRING ADJUSTMENT (Figure 23) **

Move the ribbon feed shaft to its left position. Hook an 8 oz. scale over the pin in the right ribbon spool shaft and pull horizontally at right angles to a line through the center of the pin and the center of the ribbon spool shaft. It should require 2-1/2 to 5 ozs. to start the right ribbon spool shaft moving. The proper compression of the ribbon spool shaft compression spring can be obtained by means of the spring adjusting collars. Move the ribbon feed shaft to its right position and check and adjust the left compression spring in the same manner.

RIBBON SPOOL SHAFTS SLOT ADJUSTMENT **

The ribbon spools should be held firmly in place on the ribbon spool shafts. To adjust, spread the prongs at the ends of the ribbon spool shafts (Figure 24).

* * *

** FRXD4 only.

RIBBON REVERSE PAWL LINK ADJUSTMENT (Figure 25) **

There should be .015" to .025" clearance between both right and left ribbon reverse bails when the ribbon reversing arms are against the ribbon spool cups and the ribbon reverse bails are opposite each ribbon reverse pawl. The ribbon reverse pawl links should not bind in their shoulder screws. To adjust, position the ribbon reversing arms on their shafts by means of their set screws.

RIBBON FEED SHAFT SAFETY SPRING COMPRESSION (Figure 26) **

With the main bail in its extreme upper position, slide the ribbon feed shaft to its left position. Apply the push end of a 12 lb. scale to the upper end of the right ribbon reverse pawl, and push down vertically. It should require 3 to 5 lbs. to start the spring collar moving.

NOTE: When measuring this tension, hold the ribbon feed shaft to prevent it from moving. Slide the ribbon feed shaft to its right position and check the ribbon feed shaft left safety spring in the same manner.

REMOVE THE RIBBON FEED PAWL AND RIBBON CHECK PAWL (Figure 29) **

RIBBON FEED SHAFT DETENT PLUNGER SPRING COMPRESSION (Figure 27) **

With the ribbon feed shaft in its left position, apply the push end of a 12 lb. scale to the left end of the shaft and push in line with the shaft. It should require 1-1/2 to 3-1/2 lbs. to move the shaft to its right-hand position.

RIBBON FEED LEVER SPRING TENSION (Figure 28) **

With the ribbon feed lever roller in the plunger indent, hook a 32 oz. scale over the top of the ribbon feed lever and pull horizontally toward the front of the unit. It should require 12 to 18 ozs. to start the lever moving.

REPLACE THE RIBBON FEED PAWL AND THE RIBBON CHECK PAWL (Figure 29) **

RIBBON CHECK PAWL ADJUSTMENT **

The upper end of the ribbon check pawl (Figure 29) should be at least 1/16" (plus or minus 1/64") below the lower surface of the pull bar guide. To adjust, position the ribbon check pawl by means of its mounting screw.

RIBBON CHECK PAWL SPRING PRESSURE ADJUSTMENT (Figure 29) **

With an 8 oz. scale hooked over the extreme lower end of the ribbon check pawl and pulled at right angles to the pawl, it should require 6 to 8 ozs. to start the pawl moving away from the ratchet. Make certain that the working edge of the pawl does not bind against a tooth on the ratchet when taking this pressure. To adjust, bend the ribbon check pawl spring.

* * *

** FRXD4 only.

RIBBON FEED PAWL ADJUSTMENT **

The ribbon feed pawl (Figure 29) should be positioned so that the ribbon feed ratchet will be moved one or two teeth for every revolution of the main shaft. Make this check throughout a complete revolution of the ribbon feed shaft. To adjust, position the ribbon feed pawl by means of its mounting screws.

RIBBON FEED PAWL SPRING PRESSURE ADJUSTMENT (Figure 29) **

With the main shaft in the stop position, rotate the main shaft sufficiently to make certain that the feeding edge of the pawl does not bind against the face of a tooth on the ratchet, hook an 8 oz. scale over the extreme front edge of the ribbon feed pawl and pull at right angles to the pawl. It should require 6 to 8 ozs. to start the pawl moving away from the ribbon feed ratchet. To adjust, bend the ribbon feed pawl spring.

RIGHT AND LEFT RIBBON REVERSE PAWL SPRING TENSION (Figure 26) **

With the ribbon feed shaft in its left position, hook an 8 oz. scale over the spring post on the left ribbon reverse lever and pull in line with the spring. It should require 2-1/2 to 3-1/2 ozs. to start the lever moving. Move the ribbon feed shaft to its right position and check the right ribbon reverse pawl spring in the same manner.

LEFT FUNCTION FULL BAR SPRING BRACKET ADJUSTMENT (Figure 30) **

With the main bail in its extreme downward position, hook an 8 oz. scale over the space pull bar just below the hump and pull horizontally at right angles to the pull bar. It should require 1 to 1-1/2 ozs. to start the pull bar moving. To adjust, loosen the spring bracket mounting lock nut and position the bracket. Tighten the lock nut.

LOCKING LEVER BRACKET ADJUSTMENT *

With the main bail in its lowest position and the code bars moved to the MARKING position, the blocking surface of the code bars should be approximately parallel (vertically) to the adjacent surfaces of the bell cranks when gauged by eye. To adjust, loosen the locking lever bracket mounting screws and position the bracket. Tighten the mounting screws. See Figure 40.

RIGHT FUNCTION FULL BAR SPRING BRACKET ADJUSTMENTS (Figure 31) **

With the main bail in its extreme upward position and the sensing bell cranks held away from the code bar locking lever, hook an 8 oz. scale over the upper end of the locking lever in line with the No. 1 code bar and pull horizontally at right angles to the locking lever. It should require 3-1/2 to 5 ozs. to start the locking lever moving. To adjust, loosen the right function pull bar spring bracket mounting nut and position the bracket. Tighten the mounting nut.

* * *

* FRXD3 only.

** FRXD4 only.

CODE BAR LOCKING LEVER SPRING BRACKET ADJUSTMENT *

With the main bail in its extreme upward position and the sensing ball cranks held away from the code bar locking lever, hook an 8 oz. scale over the upper end of the locking lever in line with the No. 1 code bar and pull horizontally at right angles to the locking lever. It should require 3-1/2 to 5 ozs. to start the locking lever moving. See Figure 31. To adjust, bend the ear of the bracket on which the spring is mounted.

MAIN BAIL SPRING TENSION PRELIMINARY ADJUSTMENT

With the main shaft in the stop position, hook a 25 lb. scale under the adjusting lever and pull vertically upward. It should require 14 to 15 lbs. to start the lever moving. To adjust, loosen the lock nut and position the main bail spring adjusting screw. Tighten the lock nut.

TO MAKE THE FOLLOWING ADJUSTMENTS IT WILL BE NECESSARY TO REMOVE THE CODE PUNCH AND PREPUNCH ASSEMBLIES IN THE FOLLOWING MANNER:

- (1) Place the main shaft in the stop position and place the unit so that it is resting on its rear supports.
- (2) Unhook the punch bail spring from its spring post.
- (3) Remove the punch arm link shoulder screw and disengage the link from the punch bail arm and remove it from the unit.
- (4) Remove the prepunch unit by means of its two mounting screws, being careful not to damage the cable.
- ** (5) Remove the three punch assembly mounting screws and the rear code punch block mounting screw and remove the assembly, being careful not to damage or distort the bell cranks, separator plates, or code bars.
- * (6) Remove the three punch assembly mounting screws and the two code punch block bracket mounting screws and remove the assembly, being careful not to damage or distort the bell cranks, separator plates or code bars.

SHIFT LEVER ADJUSTMENT (Figure 32) **

When the platen is latched in the LETTERS position (to the rear), the N character should print centrally on the platen. To adjust, position the shift lever stud.

FIGURES STOP SCREW ADJUSTMENT (Figure 33) **

When the platen frame is resting against the FIGURES stop screw (forward), the upper case character should print in line with the impression made by the character N in the previous adjustment. To adjust, position the FIGURES stop screw.

* * *

- * FRXD3 only.
- ** FRXD4 only.

SHIFT BAIL BRACKET ADJUSTMENT (Figure 34) **

The front surface of the shift bail bracket should be parallel to the front edge of the base. To adjust, utilize the clearance in the shift bail bracket mounting screw holes.

INTERMEDIATE BAIL ALIGNMENT ADJUSTMENT (Figure 34) **

The forward extension of the intermediate bail should engage the center of the ear on the shift bail. To adjust, utilize the clearance in the intermediate bail bracket mounting holes.

MAIN BAIL PLUNGER EXTENSION BRACKET ADJUSTMENT (Figure 34) **

The left edge of the operating surface on the main bail plunger extension should clear the side of the intermediate bail by approximately .050". To adjust, loosen the main bail plunger extension bracket lock nut and position the bracket. Tighten the lock nut.

INTERMEDIATE BAIL ADJUSTING SCREW ADJUSTMENT (Figure 35) **

With the main shaft in the stop position, the shift bail should overtravel the shift latch .005" to .015". When checking this adjustment, the play in the shift latch should be taken up in a direction to make this clearance a minimum. To adjust, position the intermediate bail adjusting screw.

PLATEN FRAME EXTENSION ADJUSTMENT (Figure 36A) **

Rotate the motor unit until the main bail is in its uppermost position. With the platen in the FIGURES position and the shift bail latched on the shift latch, there should be .010" to .020" clearance between the shift bail and vertical arm of the platen frame extension. To adjust, loosen the two platen frame extension mounting screws (Figure 32) and utilize the elongation of the left mounting hole to position the platen frame extension. Tighten the mounting screws.

SHIFT BAIL UPSTOP SCREW ADJUSTMENT (Figure 36B) **

With the main bail in its uppermost position, the platen in the LETTERS position and the shift latch unlatched, there should be .004" to .010" clearance between the vertical surface of the platen frame extension and the shift bail. To adjust, position the shift bail upstop screw.

SHIFT LEVER SPRING TENSION (Figure 37A) **

Hook an 8 oz. scale over the shift lever at the spring hole and pull horizontally to the right. With the platen frame held away from the lever, it should require 1 to 1-1/2 ozs. to just start the lever moving.

* * *

** FRXD4 only.

PLATEN FRAME SPRING TENSION (Figure 32) **

With the main shaft in the stop position and the platen in the LETTERS position, place the push end of an 8 oz. scale against the front face of the platen support and push horizontally toward the rear. It should require 6 to 7 ozs. to just start the platen frame moving.

SHIFT BAIL SPRING TENSION (Figure 35) **

Unhook the shift bail spring from the shift bail and hook an 8 oz. scale in the spring eye. With the main shaft in the stop position and the platen latched in the LETTERS position, it should require 6 to 8 ozs. to pull the spring to its position length.

SHIFT LATCH SPRING TENSION (Figure 37B) **

With the main shaft in the stop position, hook an 8 oz. scale under the shift latch just above the space pull bar toe and pull vertically upward. It should require not more than 1 oz. to start the latch moving.

PUNCH BAIL PIVOT BRACKET PRELIMINARY ADJUSTMENT (Figure 38)

The lower surface of the punch bail pivot bracket should be .080" to .090" above and parallel to the surface of the code punch bracket on which it mounts. Loosen the front pilot bearing screw lock nut and punch bail pivot clamp screw and adjust by means of the right and left tilt adjusting screws. Tighten the clamp screw and lock nut.

PUNCH BAIL ADJUSTMENT (Figure 39)

- (1) The No. 1 and No. 5 punch selector fingers should be centered with respect to the No. 1 and No. 5 code punches.
- (2) The punch bail should have some end play, not more than .004". To adjust, position the punch bail pilot screws.
- (3) With the punch bail adjusted according to the foregoing adjustment and the punch retractor springs removed, the punch retractor should float freely over the bail. To adjust, bend both legs of the punch retractor near the cross brace and in a line parallel to it.

SELECTOR FINGERS RETAINING BRACKET ADJUSTMENT

The selector fingers should have some up and down play, not more than .015" in the slot. To adjust, position the selector finger retaining bracket by means of its mounting screws. See Figure 38.

ASSEMBLE THE CODE PUNCH ASSEMBLY AND THE PREFUNCH ASSEMBLY IN PLACE ON THE BASE BY REVERSING THE PROCEDURE OUTLINED FOR ITS REMOVAL.

* * *

** FRXD4 only.

CODE BAR BELL CRANKS ADJUSTMENT (Figures 38 and 40)

- (1) The code bars should move freely between the code bar bell crank separator plates.
- (2) With the code bars positioned for BLANK selection and the locking lever resting against the code bars, there should be .010" to .030" clearance at the point of closest approach between the right ends of the code bars and the adjacent edges of the associated code bar bell cranks.

To adjust, make certain that the vertical lever bracket is mounted approximately in a vertical position and align the code bar bell cranks with the code bars by adding or removing shims between the lower separator plate and the shoulder on the pivot post to meet the first requirement. The latter requirement may be met by loosening the pivot post lock nut and moving the pivot post horizontally in the elongated mounting hole in the vertical lever bracket. Tighten the pivot post lock nut.

NOTE: When making the foregoing adjustments, make certain that the extension of each code bar bell crank fully engages the vertical link and at the same time does not overlap sufficiently to interfere with the adjacent vertical lever.

Likewise, each code bar bell crank should fully engage the end of the associated vertical lever (vertically) but the upper end of any vertical lever should not interfere with the free movement of the code bar bell crank immediately above the one with which that vertical lever cooperates.

MAIN BAIL ADJUSTING SCREW FINAL ADJUSTMENT (Figure 40) See Note (B)

With the code bars positioned for LETTERS selection and the main bail roller on the high part of its cam, there should be at least .010" clearance between the front edges of the code bars and the adjacent edges of the code bar bell crank. To obtain this clearance, adjust the main bail adjusting screw (Figure 4) keeping within the previously specified limits of *.010" to .050" between the pull bars and code bars.

* This applies to FRXD4 only.

VERTICAL LINK PILOT SCREW ADJUSTMENT

- (1) With the code bars positioned to the right (LETTERS combination), and the code bar bell cranks resting against the code bars, the left edge of the punch selector fingers should be in approximate alignment with the left edge of the punches. To adjust, position the vertical link pilot screw in its elongated mounting hole. See Figure 38.

* * *

- (B) When positioning the main bail adjusting screw or removing the main bail spring, it will facilitate the adjustment or removal if the motor unit is pivoted to the left.

- (2) With the code bars positioned to the right, the left edges of all the punch selector fingers should be approximately in a line which is at right angles to the front surface of the code punch bracket casting. To adjust, bend the vertical link bracket at the pilot screw in a plane parallel with the base plate. See Figure 38.

NOTE: Care should be exercised when bending not to disturb other parts of the bracket.

- (3) With the code bars positioned to the right (LETTERS combination), and the code bar bell cranks resting against the code bars, the left edge of the punch selector fingers should be parallel with the left edge of the punches. They should have a full bite on the punches.

NOTE: The following checks should be made when adjustments (1), (2), and (3) have been completed.

- (4) With the alternate combinations R (2-4) and Y (1-3-5) set up in the code bars and with the punch arm roller on the high part of its cam, there should be a clearance of at least .020" between the left edge of the unselected punch selector fingers and the right edge of the punches.
- (5) With the BLANK combination selected and the code bar locking lever against the code bars, the left end of the punch selector fingers should not be drawn more than halfway through their guide slots in the punch bail. If these requirements are not met, it will be necessary to refine adjustments (1) or (2) or both.

PUNCH BAIL PIVOT BRACKET FINAL ADJUSTMENT (Figure 39)

A line across the top of the punch selector fingers should be parallel to a line across the bottom of the code punches. To adjust, loosen the punch bail pivot bracket clamp screw and position the bracket by means of the right and left tilting screws (Figure 38). Tighten the clamping screw.

NOTE: Turn both tilting screws the same number of turns to prevent tilting the bracket.

PUNCH BAIL ARM STUD PRELIMINARY ADJUSTMENT

With the LETTERS combination set up, all of the punches should just perforate the tape when the motor is rotated manually. To adjust, loosen the punch bail arm stud lock nut and turn the stud in or out of the punch bail arm. See Figure 38. Tighten the lock nut.

CODE PUNCH BLOCK FEED ROLL SHIMS ADJUSTMENT

Place a piece of tape in which the feed holes have been perforated in the die block and engage the feed holes on the pins in the feed wheel. Select the letter I (No. 2 and No. 3 code punches operated) and perforate the tape. Remove the tape from the die block and check to see that the feed hole is centrally located between the code holes, when gauged by eye. The feed roll

should be free with some end play, not more than .002". See Figure 39.

NOTE: The above adjustment was made at the factory and should not require readjustment unless the shim pile-up has been disturbed or a new feed roll is to be installed. If it is necessary to readjust, the following procedure should be followed:

- (1) Manually select the BLANK combination and rotate the main shaft until the punch arm roller is on the high part of its cam. Unhook the detent lever spring and move the detent lever away from the star wheel.
- * (2) Remove the upper tape chad chute.
- (3) Remove the two code punch block assembly mounting screws.
- (4) Hold the feed pawl out of the way and remove the code punch block assembly from the punch unit, being careful not to damage the punch pins when removing them from the punch retractor.
- (5) Hold the code punch block assembly so that the support plate is upward and remove the two shoulder screws and the two support plate mounting screws. Remove the support plate, being careful not to pull out the punch pins.
- (6) Place the proper number of shims on each side of the feed wheel to obtain the proper end play as per the foregoing adjustment. The shims should be slipped on the shaft by means of the slot, being careful not to get any sharp bends or kinks in the shims.
- (7) Place the feed roll with the shims in the die block with the wide ends toward the die pins and the straight side toward the bottom of the die block.
- (8) Replace the support plate and the two mounting screws and tighten in place and recheck the location of the feed hole in relation to the code hole as specified when the No. 2 and No. 3 code punches are operated manually. If it does not meet this requirement, shift one or more shims from one side to the other.
- (9) Replace the two shoulder screws in the code punch block assembly and tighten in place. Replace the code punch block assembly on the punch unit by reversing the procedure used to remove it.

NOTE: When replacing the mounting screw on the chad chute, an A screw driver which has been magnetized will expedite replacement of this screw.

CODE PUNCH FEED ROLL DETENT PRELIMINARY ADJUSTMENT

When a piece of tape containing ten feed holes to the inch is placed

* * *

* FRXD3 only.

in the code punch die block and the code punch feed roll detent is resting in an indent between two teeth on the ratchet, the left edge of a feed hole should be visible at the left edge of the die block (when the feed holes in the tape are engaged with the pins on the feed wheel). To adjust, position the detent lever mounting plate (Figure 41) by means of its mounting screws.

CODE PUNCH FEED PAWL PRELIMINARY ADJUSTMENT (Figure 41)

With the punch arm roller on the low part of its cam, the feed pawl should rest in the bottom of the first notch below the horizontal center line of the feed roll. To adjust, position the feed pawl by means of its adjustable mounting plate.

CLUTCH MAGNET BRACKET ADJUSTMENT (Figure 42)

- (1) The clutch armature levers should have some end play, not more than .006". To adjust, add or remove shims between the levers and the bracket in which the lever shaft is mounted.
- (2) The armatures should rest against the magnet cores evenly. Check by holding a light background behind the armature cores. To adjust, loosen the magnet core mounting screws and position the cores. Tighten the mounting screws.
- (3) With the armatures held in their operated position, there should be .010" to .040" clearance between the high part of the driven clutches and their respective clutch throwout levers. The armatures should be parallel to the shafts. To adjust, loosen the clutch magnet bracket mounting screws and position the bracket. Tighten the mounting screws.

SENSING AND DISTRIBUTING DRIVING CLUTCH ADJUSTMENTS (Figure 43)

Operate the unit under power, stop the cam assemblies by releasing the clutch throwout levers, then stop the motor. There should be .005" to .015" clearance between the tops of the clutch teeth. To adjust, loosen the driving clutch member mounting screws and position the driving clutch members. Tighten the mounting screws.

SUBSHAFT BEARING BRACKET ADJUSTMENT

- (1) The subshaft should be free on its bearing with a minimum amount of end play.
- (2) The gears at both ends of the subshaft should have a minimum amount of gear play for a complete revolution of the subshaft.

To adjust, loosen the subshaft bearings bracket mounting screws and position the brackets. Tighten the mounting screws.

PUNCH ARM SHAFT OILER POSITION ADJUSTMENT

The punch arm shaft should be positioned so that the lid on the oil cup on the upper end of the shaft opens to the left. To adjust, loosen the punch arm shaft set screws and position the punch arm shaft. Tighten the set screws.

SENSING AND DISTRIBUTOR CLUTCH SPRING TENSION (Figure 43)

With the unit resting on its rear supports and the teeth of the driving clutch member meshed with the teeth of the driven clutch member, hook a 32 oz. scale over the driven clutch members on the high part of the cam surface and pull in line with the shaft. It should require 9 to 12 ozs. to just separate the clutch teeth.

PREPUNCH TAPE GUIDE ADJUSTMENT

The tape guide should be positioned so that tape threaded through it will not snag at the entrance to the die block and so that the rear of the slot in the guide lines up with the rear of the slot in the die block. To adjust, position the tape guide.

PREPUNCH TAPE GUIDE SPRING ADJUSTMENT

The tape guide spring should be positioned so that the curved tip is centered on the tape at a point opposite the cutout portion of the tape guide and the tension of the spring should hold the tape firmly, without buckling, against the rear wall of the die block slot. To adjust, position the spring by means of its mounting screw and bend the spring to obtain the pressure required. Tighten mounting screw.

PREPUNCH RETAINING BRACKET ADJUSTMENT (Figure 44)

There should be some clearance, not more than .002", between the top of the feed hole punch and the prepunch arm when the prepunch arm is at its point of highest travel. To adjust, loosen the retaining bracket mounting screws and position the bracket. Tighten the mounting screws.

PREPUNCH FEED ROLL BEARINGS ADJUSTMENT (Figure 45)

With the feed roll detent, the feed pawl, and the tape tension lever held away from the feed roll, the feed roll should be free in its bearings with some end play, not more than .004". To adjust, position the rear bearing bracket by means of its mounting screws so that the shaft is free in its bearings and position the rear bearing bushing to obtain the correct end play. Tighten mounting screws and lock nuts.

PREPUNCH TAPE TENSION LEVER STUD ADJUSTMENT (Figure 45)

The tape tension lever stud should be centrally located with respect to the feed roll pins so that the tension lever does not touch the feed pins on the feed roll when the play in the feed roll and tension lever is taken up in opposite directions. To adjust, add or remove shims between the shoulder on the tape tension lever stud and its mounting bracket.

TAPE TENSION LEVER TORSION SPRING ADJUSTMENT (Figure 46)

Hook an 8 oz. scale over the end of the slotted extension of the tape tension lever and pull at right angles to the lever. It should require 5 to 5-1/2 ozs. to start the slotted extension of the tape tension lever moving away from the feed roll. To adjust, loosen the tape tension lever stud lock nut (Figure 45) and rotate the stud in either a clockwise or counterclockwise direction. Tighten the lock nut.

PREPUNCH FEED ROLL DETENT PRELIMINARY ADJUSTMENT

Adjust the prepunch roll detent by rotating its eccentric so that the high part of the eccentric is positioned to the left and the slot is horizontal. See Figure 46.

PREPUNCH FEED PAWL ECCENTRIC PRELIMINARY ADJUSTMENT (Figure 47)

With the punch arm roller on the low parts of its cam, the feed pawl should rest in the bottom of the first notch which is just below the horizontal center line of the feed roll. To adjust, position the feed pawl eccentric, locating the high part of the eccentric to the left.

PREPUNCH ADJUSTMENT

- (1) A piece of unperforated tape should be held friction tight (by means of the prepunch pin) in the prepunch block when the punch arm roller is on the high part of its cam. To adjust, position the eccentric (Figure 47) on the prepunch operating bail.
- (2) There should be a clearance of .060" between the end of the prepunch arm gauge and the prepunch block. To adjust, loosen the prepunch arm gauge mounting nuts and position the gauge. Tighten the mounting nuts.
- (3) Remove the tape from the prepunch block and readjust the eccentric (Figure 47) on the prepunch operating bail so that there is .030" to .035" between the end of the prepunch arm gauge and prepunch block. See Figure 44. The high part of the eccentric should be positioned above the center of a horizontal of the eccentric.

PREPUNCH FEED ROLL DETENT FINAL ADJUSTMENT

Refine the adjustment of the feed roll detent eccentric (Figure 46) so that the perforations in the tape meet the standard spacing of ten holes to the inch when operated under power. This may be checked by perforating a length of tape and checking it against the 2215 tape gauge.

PREPUNCH FEED PAWL ECCENTRIC FINAL ADJUSTMENT (Figure 44)

Insert a piece of unperforated tape into the prepunch block and rotate the motor by hand until the tape has been punched and the punch has just been withdrawn from the tape. With the detent lever held away, rotate the star wheel to the right, taking up the clearance between the tooth on the feed pawl and a tooth on the feed roll. With the star wheel held in this position, allow

the detent lever to contact the star wheel. In this position there should be .020" to .030" clearance between the lower surface of the notch in the star wheel and the roller on the detent lever. To adjust, position the feed pawl by means of its eccentric (Figure 47), keeping the high part to the left. When checked under power, see that the feed holes are not burred.

TAPE STRIPPER PLATE ADJUSTMENT (Figure 45)

There should be some clearance, not over .010", between the upper edge of the tape stripper plate and the feed roll. Check for one complete revolution of the feed roll. To adjust, loosen the tape stripper plate mounting screws and position the stripper plate. Tighten the mounting screws.

PREPUNCH OPERATING BAIL SPRING TENSION (Figure 47)

Rotate the motor unit until the punch arm roller is on the low part of its cam. With the prepunch operating bail lower extension held against the operating bail eccentric, hook a 12 lb. scale over the spring post in the prepunch operating bail and pull horizontally in line with the spring to the right. It should require 3 to 4-1/2 lbs. to start the prepunch operating bail moving.

PREPUNCH FEED ROLL DETENT LEVER SPRING TENSION (Figure 46)

With a 32 oz. scale hooked over the detent lever at the roller and pulled at right angles to the detent lever, it should require 10 to 15 ozs. to start the detent lever roller away from the star wheel.

PREPUNCH FEED PAWL SPRING TENSION (Figure 47)

With the main shaft in the stop position, apply the push end of an 8 oz. scale to the feed pawl just above the curved portion at the spring hole and push horizontally to the left. It should require 3 to 5 ozs. to start moving the feed pawl away from the feed roll.

PREPUNCH FEED PAWL RELEASE LEVER SPRING TENSION (Figure 46)

With the push end of an 8 oz. scale applied to the upper flat extension of the feed pawl release lever and pushed vertically downward, it should require 1/2 to 2 ozs. to just start to move the feed pawl release lever.

CODE PUNCH BAIL ARM STUD FINAL ADJUSTMENT *

With the selector magnets energized and the unit operating under power, feed out a length of tape by operating the clutch release lever (Figure 16). The code punches should perforate a clean hole in the tape. To adjust, loosen the punch bail arm stud lock nut (Figure 38) and position the punch bail arm stud so that the code punch die pins just perforate the tape; turn the stud an additional 1/3 turn and tighten the lock nut.

* * *

* FRXD3 only.

CODE PUNCH BAIL ARM STUD FINAL ADJUSTMENT **

With the selector magnets energized and the unit operating under power, feed out a length of tape by operating the clutch release lever (Figure 16). The code punches should perforate a full lid with a minimum amount of tearing. To adjust, loosen the punch bail arm stud lock nut (Figure 38) and position the punch bail arm stud. Tighten the lock nut.

CODE PUNCH FEED ROLL DETENT FINAL ADJUSTMENT

With the selector magnets energized and the unit operating under power, feed out a length of tape by operating the clutch release lever (Figure 16). The center line of the code holes should line up with the center line of the feed holes. To adjust, position the feed roll detent mounting plate (Figure 41).

NOTE: Check the code punch feed pawl adjustment and readjust if necessary.

CODE PUNCH FEED ROLL DETENT SPRING TENSION (Figure 41)

Hook a 32 oz. scale over the detent lever at the roller and pull at right angles to the detent lever. It should require from 6 to 9 ozs. to start the roller moving away from the star wheel.

CODE PUNCH FEED PAWL SPRING TENSION (Figure 48)

With the feed roll detent lever held out of the way, hook an 8 oz. scale over the feed pawl at the spring hole. It should require 1 to 2-1/2 ozs. to start the feed pawl moving.

TAPE OPERATING BAIL SPRING TENSION (Figure 48) **

Unhook the tape operating bail spring from the bail and hook an 8 oz. scale in the spring eye. With the tape operating bail resting against the sensing unit plate, it should require 1/2 to 2 ozs. to extend the spring to its position length. Rehook the spring.

SELECTOR FINGER BELL CRANKS SPRING TENSION

Remove the code punch tape guide. With the main bail shaft in the stop position, hook an 8 oz. scale over the selector finger bell cranks between the spring holes and pull vertically upward. It should require 1-1/2 to 3 ozs. to start each bell crank moving. See Figure 38 for location of parts. Replace the code punch tape guide.

* * *

** FRXD4 only.

CODE PUNCH TAPE GUIDE ADJUSTMENT

The tape should enter the code punch block without buckling. To adjust, loosen the code punch tape guide mounting screws and position the guide. Tighten the mounting screws.

RIBBON GUIDE ADJUSTMENT (Figure 49) **

The ribbon guide should be positioned so that the ribbon clears the platen by approximately .031" when the platen is either in the LETTERS or FIGURES position and so that the ribbon is fully covering the platen. To adjust, loosen the ribbon guide mounting screws and position the guide. Tighten the mounting screws.

PUNCH RETRACTOR SPRING TENSION (Figure 50)

Rotate the motor unit until the punch arm roller is on the low part of its cam. Hook a 12 lb. scale under the tip of the punch retractor and pull vertically upward. It should require 5-1/2 to 6-1/2 lbs. to start the punch retractor moving away from its stops.

PIVOTED TRANSMITTER BRACKET SHIMS ADJUSTMENT

When the pivoted transmitter is held against the code punch block, the tape channel on the pivoted transmitter should be approximately in the same horizontal plane as the tape channel in the code punch block. To adjust, increase or decrease the number of shims between the pivoted transmitter bracket and the base casting.

PIVOTED TRANSMITTER PILOT SCREWS ADJUSTMENT

The pivoted transmitter should be positioned so that the pins in the feed pin oscillator are in line with the feed holes in the tape at the point where the tape emerges from the code punch block. To adjust, position the pivoted transmitter by means of its pilot screws (Figure 51), adjusting the screws so that the assembly pivots freely, with a minimum amount of end play, not to exceed .003".

PIVOTED TRANSMITTER TAPE GUIDE PLATE ADJUSTMENT

CAUTION: Do not raise or close the transmitter lid unless the sensing shaft is in the stop position.

With a section of tape perforated with LETTERS combination emerging from the code punch block and pivoted transmitter tape guide touching the code punch block, the pivoted transmitter tape guide should be adjusted on the pivot frame by utilizing the play in the enlarged mounting holes to meet the following requirements:

* * *

** FRXD4 only.

- (1) With the sensing cam assembly in the stop position and the tape feed holes engaged with the tape feed pins, the tape should not buckle against either the front or rear edges of the tape guide. Position the tape guide plate forward or backward to meet this requirement. See Figure 51 for location of parts.
- (2) With the sensing cam assembly rotated until the sensing pins are in their uppermost position, the pins should be approximately in the center of the holes in the perforated tape and approximately in line with the center line through each hole. To adjust, position the tape guide plate from left to right and from front to rear, at the same time checking the requirement (1). See Figure 51 for location of parts.

TAPE PIN OSCILLATOR BACKSTOP SCREW ADJUSTMENT

With the sensing cam sleeve in the stop position, place a length of tape which has ten holes to the inch in the pivoted transmitter. Operate the sensing cam sleeve slowly until the tape pins leave and are just about to re-enter the tape feed holes. Under this condition the feed pins should be centered directly beneath the feed holes in the tape. To adjust, position the tape pin oscillator backstop screw. See Figure 54 for location of parts.

TAPE OPERATING BAIL ADJUSTMENT

The blade of the tape operating bail (Figure 48) which rides on the pivoted transmitter when the transmitter is not in its left latched position should pass midway between the lid latch spring and the locating stud of the transmitter lid. This check should be made with the transmitter lid closed and latched. To adjust, bend the blade of the tape operating bail.

TAPE RETAINING LID LATCH ADJUSTMENT (Figure 51)

- (1) With an 8 oz. scale hooked on the latch spring, adjacent to and above the tape guide and pulled at right angles to the latch spring, it should require $3/4$ to 1 oz. to start moving the flat surface of the latch spring away from the tape guide plate. To adjust, bend the latch spring.

NOTE: Care should be taken so as not to bend the pivoted frame.

- (2) Position the lid latch spring by means of its enlarged mounting holes and screws so that the pivoted transmitter lid will be latched with no appreciable play between the lid and the guide plate and there will be a clearance of approximately $3/32$ " between the left edge of the latch spring and the edge of the slot in the tape guide plate.

TAPE HOLDING LEVER SPRING TENSION

Unlatch and raise the transmitter lid. Rotate the sensing shaft cam sleeve until the tape holding lever is in the indent of its cam. Hold the pivoted transmitter in a vertical position and apply the push end of an 8 oz. scale to the pin in the tape holding lever (at the sensing unit guide plate) and push down vertically. It should require 2 to 4 ozs. to just start the

lever moving. Rotate the sensing shaft cam sleeve to the stop position and close and latch the transmitter lid.

Y LEVER PIVOT SHAFT ADJUSTMENT (Figure 52)

With the cam follower tip of each Y lever resting firmly on the high part of the associated cam, the tip of the sensing finger which is withdrawn the least distance into the sensing assembly guide plate should be flush with or not more than .005" below the surface of the tape channel in the guide plate. Check by eye. Check with pivoted transmitter in three positions -- against the die block, center position, and against the left stop. To adjust, position the Y lever pivot shaft up or down in the transfer base casting by means of the adjusting cams on each end of the pivot shaft.

Y LEVER GUIDE PLATE ADJUSTMENT (Figure 52)

When the sensing cam is rotated so that the cam follower tips of the Y levers are resting firmly on the high part of their associated cams, there should be some clearance between the top edge of the lower arm of the Y lever and the top of its associated slot in the guide. To adjust, position the Y lever guide plate on its mounting screws in the transfer assembly casting.

NOTE: The following requirements should be met after the above adjustment has been made:

- (1) With the cam follower tips on the Y levers opposite the low part of its associated cam and the Y lever springs unhooked, the Y levers and sensing pins should move freely in their guides. Rehook the springs.
- (2) With the cam follower tips on the Y levers opposite the low part of the associated cam, the lower edge of the upper arm of the Y lever should rest firmly in the bottom of the associated guide slot in the guide plate.
- (3) When the clearance between the top edge of the lower arm of the Y levers and the top of the associated slot is reduced to zero by hand, the sensing pins should not become disengaged from the sensing pin guide plate.

If any of the foregoing requirements are not met, the Y lever guide plate adjustment should be refined.

Y LEVER SPRING TENSION (Figure 53)

With the upper arms of the Y levers resting firmly in the bottom of their associated slots, hook an 8 oz. scale on the Y levers just adjacent to the left side of the guide and pull upward. It should require 1 to 2-1/2 ozs. to start each Y lever moving.

OSCILLATING LEVER ADJUSTMENT (Figure 54)

With the cam follower tip of the oscillating lever extension riding firmly on the low part of its cam, the surface of the lever in which the feed pins mount should rise to a point of being flush with or not more than .015" below the lower surface of the tape guide channel in the sensing guide plate at any point during the feed motion from right to left. To adjust, change the angular relation between the oscillating lever and the oscillating lever extension by means of the adjusting slot and clamp screw.

NOTE: Check that the tips of the feeding pins clear the tape as the lever moves from left to right on the return portion of the tape feeding cycle when the cam follower tip on the oscillating lever extension is on the high part of its cam.

FEED PIN OSCILLATOR SPRING TENSION (Figure 54)

With the sensing shaft in the stop position, hook an 8 oz. scale over the left pin in the feed pin oscillator and pull horizontally to the left. It should require 1 to 2 ozs. to start the feed pin oscillator moving.

TAPE FEED LEVER ADJUSTMENT

The tape pin oscillator should start moving to the left immediately after the tape pin feed lever extension roller (Figure 55) starts to ride to the low part of its cam. To adjust, engage the sensing shaft clutch and rotate the motor by hand until the tape feed lever extension just starts to move. Change the angular relation between the tape feed lever and the tape feed lever extension by means of the adjusting slot and clamp screw (See Figure 55) so that the tape feed lever just starts to move to the left. Tighten the clamp screw. Recheck the requirements and refine the adjustment if necessary.

OSCILLATING LEVER EXTENSION SPRING TENSION (Figure 56)

With the cam follower tip of the oscillator lever extension resting firmly on the high part of its cam, apply the push end of a 64 oz. scale to the oscillator lever extension at the spring hole and push to the right as nearly in line with the spring as possible. It should require 40 to 48 ozs. to just start the oscillator lever extension moving.

TAPE FEED LEVER EXTENSION SPRING TENSION (Figure 55)

With the sensing cam sleeve in the stop position and the tape feed lever cam roller resting on its cam, unhook the upper end of the tape feed lever extension spring from the spring bracket and hook a 64 oz. scale in the spring eye and pull upward. It should require 44 to 60 ozs. to stretch the spring to its position length.

PIVOTED TRANSMITTER BACKSTOP SCREW ADJUSTMENT (Figure 48)

With the pivoted transmitter rotated away from code punch block against its backstop screw and the latch on the tape depressing lever engaged with the pivoted transmitter, there should be .020" to .040" clearance between

the latch on the tape depressing lever and the adjacent latching edge on the pivoted transmitter plate. To adjust, position the pivoted transmitter backstop screw in the backstop bracket. Bend the bracket if necessary.

TAPE GUIDE BLADES ADJUSTMENT

As the pivoted transmitter is pivoted from right to left, the tape guide blades should pass between the STOP and No. 1 and between the No. 4 and No. 5 sensing fingers without touching the sensing fingers or the underside of the pivoted transmitter frame. To adjust, position the tape guide blades on the pivoted transmitter backstop bracket by means of the enlarged mounting holes and screws and by bending blades as required. See Figure 48.

REMOVE THE TRANSFER BAIL AND SLIDE ASSEMBLY FROM THE BASE CASTING TO MAKE THE FOLLOWING ADJUSTMENTS:

LOWER TRANSFER SLIDE BAR ECCENTRIC SHAFT PRELIMINARY ADJUSTMENT (Figure 57)

The lower transfer slide bar eccentric shaft should be positioned so that its high part extends downward. To adjust, loosen the eccentric shaft lock nuts on the rear of shaft and position the eccentric shaft in the transfer slide mounting brackets. Tighten the lock nuts.

LOWER TRANSFER SLIDE BAR ECCENTRIC SHAFT COLLAR ADJUSTMENT

The transfer slide bars should move freely in their guides and there should be some end play, not more than .010", between the set collar on the lower eccentric shaft and the adjacent slide bar when the play is taken up in a direction away from the collar. To adjust, loosen the set collar set screws and position the set collar. See Figure 57. Tighten the set screws.

TRANSFER LEVER BAIL ADJUSTMENT (Figure 57)

With the transfer lever bail spring unhooked, the T transfer levers should line up centrally with their associated slide bars and the bail should rotate freely on its pilot screws with some end play, not more than .005". To adjust, position the pilot screws in the bracket.

TRANSMITTER CONTACT OPERATING BAILS ADJUSTMENT (Figure 58A)

The transmitter contact operating bails should line up centrally with the associated camming projections on the transfer slide bars and the bails should rotate freely on their bearing shaft with some end play, not more than .005". To adjust, loosen the set screw and position the one set collar against the aligned transmitter contact operating bails and tighten the set screw. Loosen the set screw in the other set collar and position this collar for the specified clearance when the play in the bails is taken up in a direction toward the collar previously adjusted. Tighten the set screw in the adjusted set collar.

REMOVE THE TRANSMITTER CONTACT ASSEMBLY BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS:

TRANSFER LEVER AND SLIDE ASSEMBLY ADJUSTMENT (Figure 58B)

Rotate the sensing shaft to the stop position and mount the transfer lever and slide assembly on the base casting. Position the assembly so that the T levers line up centrally with the Y levers and that there is an approximately equal distance between the T and Y levers on the front and rear sets of levers.

TRANSFER T LEVER BAIL ECCENTRIC SHAFT ADJUSTMENT

Loosen the transfer bail extension adjusting clamp screw (Figure 60). With a piece of tape perforated with the Y combination inserted in the pivoted transmitter, so that the Y combination will be selected, trip the sensing shaft clutch and rotate the motor by hand until the transfer bail extension roller is on the high part of its cam. With the transfer bail extension roller held against the cam, press the transfer bail manually to the right until the slide levers are moved against their stops. Do not jam. Under this condition, at least one slide lever should be moved upward against its stop and at least one, which is downward, should also be against its stop. Tighten the transfer bail extension adjusting screw. To adjust, loosen the lock nut and position the bail eccentric shaft (Figure 60), keeping the high part of the eccentric shaft to the right. Tighten the lock nut.

TRANSFER LEVER AND SLIDE ASSEMBLY FINAL ADJUSTMENT (Figure 59)

- (1) With the Y code combination set up on the Y transfer levers and the transfer bail extension cam roller on the high part of its cam (Figure 60), there should be a clearance equal within .010" between the T levers and the Y levers when measured between the top prongs of the front set of levers and the bottom prongs of the second set of levers. To adjust, add or remove an equal number of shims under the three legs of the transfer bail assembly bracket.
- (2) There should be a clearance equal within .004" between the T and Y levers when measured between the bottom prongs of the front and rear set of levers. To adjust, loosen the transfer bail assembly mounting screws and position the bracket. Tighten mounting screws.

TRANSFER BAIL EXTENSION ADJUSTMENT

- (1) Insert a piece of tape perforated with the Y code combination in the pivoted transmitter and rotate the motor by hand until the transfer bail extension cam roller is on the high part of its cam and the Y code combination is set up on the Y levers. With the play in the transfer slides taken up in a direction to make this clearance a maximum, there should be some clearance, not over .006", between the lower prongs of the No. 1 and No. 5 T and Y levers. To adjust, loosen the transfer bail extension clamp screw and position the transfer bail extension by means of the adjusting hole and tighten the clamp screw. See Figure 60.
- (2) Insert a piece of tape perforated with the BLANK code combination in the pivoted transmitter and rotate the motor by hand until the transfer bail extension cam roller is on the high part of its cam. With the play in the transfer slides taken up in a direction to make this

clearance a maximum, there should be some clearance, not over .010", between the closest set of T and Y levers. If necessary, loosen the lock nut and refine the bail eccentric shaft adjustment, keeping the high part of the eccentric to the right. Tighten the lock nut. See Figure 60. Recheck (1) and readjust if necessary.

TRANSFER BAIL SPRING TENSION

With the sensing shaft in the stop position and the push end of a 32 oz. scale applied to one of the spacers on the transfer bail eccentric shaft (Figure 57) and pushed horizontally to the right, it should require 9 to 11 ozs. to just start the transfer bail moving.

NOTE: The transmitting contact bails should be rotated out of the way to permit the insertion of the scale push rod.

DISTRIBUTOR CONTACT ADJUSTMENTS (Figure 61)

NOTE: The following adjustments are to be made with the distributor contact levers on the high part of their cams.

- (1) With the push end of an 8 oz. scale applied to the ends of the short contact springs and pushed horizontally to the left, it should require 1/2 to 1-1/2 ozs. to start the springs moving away from the contact levers. To adjust, bend the short contact springs.
- (2) There should be .015" to .020" gap between the contact points. To adjust, position the adjusting screws.
- (3) With the pull end of an 8 oz. scale hooked over the end of the long contact springs and pulled horizontally to the left, it should require 4-1/2 to 5-1/2 ozs. to start the contact springs moving away from the adjusting screws. To adjust, bend the long contact springs and recheck item (2).
- (4) With the short contact spring held away, hook the pull end of a 32 oz. scale over the lower end of the contact levers and pull horizontally to the right. It should require 10 to 12 ozs. to just start the lever moving. To adjust, loosen the nut holding the spring bracket to the casting and position the bracket. Tighten the nut.

If a stroboscope is available, the contact gap (item 2) may be adjusted in the following manner:

- (1) With the light image of the STOP impulse lined up with the zero mark on the stop segment of the stroboscope set scale, adjust the stop contact gap of the unit by means of its adjusting screw so that the end of the light image lines up with the 142 mark (plus or minus one division) on the stop segment scale. Adjust the line transmitting contacts gap by means of the adjusting screws until their light images are equal within plus or minus one division of the length of their respective segments on the stroboscope scale.

- (2) With the START pulse zero indication on the stroboscope scale in line with the end of the STOP impulse light image, see that beginning and ends of the light images of all five transmitting contact images are within five divisions of their segment length on their respective stroboscope scale lengths. If the signals do not meet these requirements, it will be necessary to refine the contacts gap adjustment.

NOTE: In order to meet these requirements, the contact gap may be reduced to a minimum of .010" or increased to exceed the .020" maximum limit of the adjustment if it is required.

TRANSMITTER AUXILIARY CONTACT ADJUSTMENT (Figure 62)

NOTE: Before making any of the following contact assembly adjustments, observe that the bakelite tips on the longer contact springs are centrally aligned with their respective levers and the contact points on opposing contact springs are centrally aligned with each other.

- (1) With the bakelite tip of the long contact spring resting against the transmitter auxiliary lever and the lever resting against the high part of its cam, hook the pull end of an 8 oz. scale on the end of the short contact spring and pull approximately at right angles to the contact spring. It should require 1/2 to 1-1/2 ozs. to just separate the contact points on the contact springs. To adjust, bend the short contact springs, maintaining a slight clearance between the springs and backstop.
- (2) With the bakelite tip of the long contact spring resting against the transmitter auxiliary lever and the lever resting on the low part of its cam, hook an 8 oz. scale over the long contact spring at the contact point and pull approximately at right angles to the contact spring. It should require 1-1/2 to 2-1/2 ozs. to start the bakelite tip on the long contact spring moving away from its lever. To adjust, bend the long contact spring.
- (3) With the auxiliary contact lever on the low part of its cam and the bakelite tip of the long contact spring resting against the contact lever, there should be .015" to .020" gap between the contact points. To adjust, bend the backstop for the short spring.
- (4) Recheck adjustment No. 1.

DISTRIBUTOR CLUTCH RELEASE CONTACT ADJUSTMENT (Figure 63)

NOTE: When checking the following adjustments, the sensing shaft should be in the stop position and the bakelite tip on the long contact spring should rest against its contact lever.

- (1) With the distributor clutch release contact lever resting on the high part of its cam, unhook the distributor clutch contact lever spring from its mounting bracket and hook a 32 oz. scale in the spring eye. It should require 7 to 12 ozs. to stretch the spring to its position

length. Replace the spring.

- (2) Hook the pull end of an 8 oz. scale on the long contact spring at the contact point and pull approximately at right angles to the contact spring. It should require 1 to 2 ozs. to start the bakelite tip on the long contact spring moving away from the contact lever. To adjust, bend the long contact spring.
- (3) There should be .020" to .025" gap between the contact points. To adjust, bend the stiffener on the short contact spring.
- (4) Hook an 8 oz. scale over the end of each short contact spring and pull approximately at right angles to the spring. It should require 1/2 to 1-1/2 ozs. to just start each short contact spring moving away from its stiffener. To adjust, bend the short contact springs.
- (5) With the contact levers opposite the indents of their cams and the contacts closed, there should be some clearance between the short contact springs and their backstops. If there is no clearance, refine the adjustment in item 2.

REMOVE THE TAPE-OUT CONTACT ASSEMBLY AND ITS MOUNTING BRACKET TO MAKE THE FOLLOWING ADJUSTMENTS:

TAPE-OUT CONTACT LEVER SPRING TENSION (Figure 64)

Rotate the sensing shaft cam sleeve until the tape-out sensing lever drops off of the high part of its cam. Place the unit so that it is resting on its rear supports. Hold the tape-out lever and tape-out lever latch (Figure 66) away from the stud in the lower extension of the tape-out sensing lever. Hook an 8 oz. scale over the upper extension of the tape-out sensing lever, close to the guide, and pull parallel to the guide. It should require 4 to 5-1/2 ozs. to just start the tape-out sensing lever moving.

TAPE-OUT RELEASE AND TAPE-OUT LEVERS ASSEMBLY ADJUSTMENTS

- (1) With the sensing shaft in the stop position and the tape-out release lever in its unlatched position, there should be .010" to .015" clearance between the oscillating lever extension and the tape release lever. To adjust, loosen the levers assembly mounting plate mounting screws and position the levers assembly mounting plate. Tighten the mounting screws.
- (2) With the tape release lever in its latched position, the top of the feed pins should be below, not to exceed .015", the tape guide in the pivoted transmitter. To adjust, add or remove shims between the base casting and the lever assembly mounting plate.
- (3) Recheck (1).

TAPE-OUT CONTACTS ADJUSTMENT (Figure 65A)

- (1) The short contact spring and its stiffener should be straight. The short contact spring should be tensioned lightly against its stiffener.
- (2) Hook an 8 oz. scale over the end of the long contact springs and pull at right angles to the spring. It should require $3/4$ to $1-1/4$ ozs. to just open the contacts.

To adjust, bend the contact springs and stiffeners.

WITH THE SENSING SHAFT IN THE STOP POSITION, REPLACE THE TAPE-OUT CONTACT ASSEMBLY AND ITS MOUNTING BRACKET.

TAPE-OUT CONTACT BRACKET ADJUSTMENT

- (1) With the sensing shaft in the stop position, the tape-out lever in its unlatched position, and the long contact spring moved to the right until the left side of the bakelite tip is resting against the blocking surface of the tape-out lever, there should be .010" to .020" gap between the contact points of the tape-out contact springs. The contact springs should be approximately at right angles to the base. Figure 65B.
- (2) With the tape-out lever in its latched position, there should be .010" to .030" clearance between the end of the bakelite tip of the long contact spring and the tape-out lever at the closest point.
- (3) Rotate the sensing shaft cam sleeve until the tape-out lever rides off of the high part of its cam. With the tape-out pin in its uppermost position and the bakelite tip of the long contact spring resting against the tape-out lever extension, the left side of the bakelite tip should overtravel the blocking surface of the tape-out lever by at least .010" when the play in the tape-out lever is taken up in a direction to make this clearance a minimum.

NOTE: With a piece of tape inserted in the sensing unit and with the tape-out sensing lever opposite the low part of its cam, there should be some clearance between the tape-out lever sensing lever lower extension stud and the bakelite tip on the long contact spring of the tape-out contact assembly.

To adjust, loosen the tape-out contact bracket mounting screws and position the bracket to meet the foregoing adjustments. Tighten the mounting screws.

TAPE-OUT LEVER SPRING TENSION (Figure 66)

With the sensing cam shaft in the stop position, the tape-out release lever and the tape-out lever unlatched and the unit resting on its rear supports, hook an 8 oz. scale over the front edge of the formed part of the tape-out lever and pull at right angles to the lever. It should require $1-1/2$ to 3 ozs. to just start the lever moving.

TAPE RELEASE LEVER SPRING TENSION (Figure 66)

With the sensing shaft in the stop position and the tape release and tape-out levers unoperated, place the unit so that it is resting on its rear supports. Hook an 8 oz. scale over the front edge of the formed end of the tape release lever, with the tape release latch held away from the tape release lever. Pull at right angles to the lever. It should require 2-1/2 to 3-1/2 ozs. to just start the tape release lever moving.

TAPE-OUT RELEASE AND TAPE RELEASE LEVERS COMPRESSION SPRING TENSION

With the sensing shaft in the stop position, the tape-out release lever latched, the tape-out lever unlatched, and the unit resting on its rear supports, place the push end of an 8 oz. scale against the tip of the tape-out lever latch. See Figure 66. It should require 1 to 2-1/2 ozs. to just start the latch moving.

TRANSMITTER STOP CONTACT ADJUSTMENT (Figure 67)

- (1) Move the pivoted transmitter so that it is resting against its back-stop screw (left position).
- (2) With the short contact spring tensioned against its backstop and aligned so that it is parallel to its mounting bracket, hook an 8 oz. scale over the end of the insulator tip on the long contact spring and pull at right angles to the long contact spring. It should require 1/4 to 1/2 ozs. to just open the contacts. To adjust, bend the long contact springs.
- (3) With a piece of perforated tape emerging from the code punch unit and engaged in the pivoted transmitter, the transmitter stop contacts should be separated with a minimum contact gap of .010" when the last character on the tape is being sensed. The contacts should be closed with some clearance between the insulator tip on the long contact spring and the end of the contact pin when the second to the last character on the tape is being sensed. To adjust, position the contact assembly by means of the two contact tilting screws.

PUNCH BAIL ARM SPRING TENSION

With the punch bail arm roller resting on the low part of the punch cam, hook a 12 lb. scale over the punch bail arm at the roller and pull at right angles to the arm. It should require 6 to 7 lbs. to start the roller moving away from the cam.

DISTRIBUTOR SHAFT CLUTCH THROWOUT LEVER SPRING TENSION

Place the unit so that it is resting on its rear supports. With the distributor shaft clutch teeth engaged and the distributor shaft clutch throw-out lever resting on the low part of its cam, hook an 8 oz. scale over the clutch armature lever between the coils close to the **lower edge and pull horizontally** at right angles to the lever. It should require 3 to 4 ozs. to start the lever moving. See Figure 42 for location of parts.

DISTRIBUTOR SHAFT CLUTCH DETENT LEVER SPRING TENSION (Figure 68)

With the distributor shaft in the stop position, clutch disengaged, hook an 8 oz. scale over the distributor shaft clutch detent lever at the roller and pull at right angles to the detent lever. It should require 1-3/4 to 3 ozs. to start the roller moving away from the detent cam.

SENSING SHAFT CLUTCH THROWOUT LEVER SPRING TENSION

Place the unit so it is resting on its four feet. With the sensing shaft clutch teeth engaged and the sensing shaft clutch throwout lever resting on the low part of its cam, hook an 8 oz. scale over the sensing shaft clutch throwout lever spring post near the spring and pull horizontally at right angles to the lever. It should require 5 to 6 ozs. to start the lever moving. See Figure 42 for location of parts.

SENSING SHAFT CLUTCH DETENT LEVER SPRING TENSION (Figure 68)

With the sensing shaft in the stop position, clutch disengaged, hook an 8 oz. scale over the sensing shaft clutch detent lever at the roller and pull upward at right angles to the lever. It should require 1-3/4 to 3 ozs. to start the roller moving away from the detent cam.

TAPE REEL TAPE-OUT CONTACT LEVER ADJUSTMENT (Figure 69)

- (1) Swing the tape reel tape-out contact lever against the side of the tape reel container. The curve of the contact lever should be such as to permit the greatest amount of the curved surface of the contact lever to touch the adjacent surface of the container. To adjust, bend the contact lever.
- (2) The contact lever should clear the indented edge of the tape reel container at all times. To adjust, loosen the nuts on the tape reel tape-out lever bracket mounting screws and position the bracket. Tighten the nuts.

TAPE REEL TAPE-OUT CONTACTS ADJUSTMENT (Figure 69)

- (1) The stiffener of the tape reel tape-out contact should be straight. To adjust, bend the stiffener.
- (2) With the contact lever held away from the contact, hook an 8 oz. scale at the contact point of the short contact spring and pull in a horizontal direction. It should require 2 to 3 ozs. to just move the short contact spring away from its stiffener. To adjust, bend the short contact spring.
- (3) With the contact lever held away from the contacts, there should be .015" to .020" contact gap between the contact points. To adjust, bend the long contact spring.

TAPE REEL TAPE-OUT ADJUSTING SCREW ADJUSTMENT

The tape reel tape-out adjusting screw should close the tape-out contacts when the end of the tape-out contact lever is within $5/16$ " to $3/8$ " of the wood filler in the center of the tape reel. To adjust, loosen the lock nut and position the adjusting screw. Tighten the lock nut.

TAPE REEL TAPE-OUT CONTACT LEVER SPRING TENSION (Figure 69)

Unhook the tape reel tape-out contact lever spring from the spring post on the lever and hook a 32 oz. scale in the eye of the spring. With the tape reel tape-out lever held so that the curved portion is touching the curved part of the tape reel container, it should require 7 to 9 ozs. to stretch the spring to its position length. Replace the spring on the spring post.

TRANSMITTER CONTACT ASSEMBLY CONTACT AND SPRING TANG ALIGNMENT (Figure 70)

- (1) The alignment of the contacts should be within the limits indicated by Figure 71. Gauge by eye.
- (2) The width of each spring tang should lie entirely within the slots in the comb. Gauge by eye.
- (3) The spring studs should clear the springs through which they pass in all positions of travel of the studs.

To adjust, loosen the contact spring mounting screws so that they are friction tight and align the contact springs. Tighten the mounting screws.

TRANSMITTER CONTACT ASSEMBLY COMB ADJUSTMENT (Figure 70)

The spring tangs should rest in the slot of the comb so that the clearance from the free end of the tang to the bottom of the slot is approximately $1/2$ the depth of the slot. To adjust, loosen the mounting screws and position the comb in the enlarged mounting holes. Tighten the mounting screws.

REPLACE THE TRANSMITTER CONTACT ASSEMBLY, TAKING CARE TO ALIGN THE STUDS WITH THE ECCENTRICS ON THE CONTACT BAILS.

TRANSMITTER CONTACT SPRING MOUNTING PLATE ADJUSTMENT

The following spring tension requirements should be observed:

- (1) Unless otherwise specified, the tension should be measured in the normal unoperated position.
- (2) Both sections of the bifurcated (split) springs should be in alignment with each other so that the contact on the bifurcated springs BREAK or MAKE with the associated springs approximately at the same time.
- (3) When gauging the tension on the solid springs, the tip of the gauge should be applied near the end of the springs.

- (4) There should be a minimum clearance of .008" between adjacent springs, whether in the operated or unoperated position. Gauge by eye.
- (5) The shorter end of the bakelite stud on each contact assembly should be centrally aligned with its associated contact bail eccentric.

To adjust, position the individual pile-up mounting plate by means of their two mounting screws and enlarged mounting holes in the contact bracket.

TRANSMITTER CONTACT BRACKET AND BOOSTER SPRINGS PRELIMINARY ADJUSTMENT

- (1) The tang of each booster spring should be in line with the edge of the spring.
- (2) With the slide levers in the SPACING (lower) position and the slots in all the contact bail eccentrics in a vertical position (high side up or down according to the position that gives the fullest engagement between the end of the plunger and the curvature of the eccentric) the gap between the No. 1 and No. 5 contact booster springs and their studs should be .075" to .080". To adjust, loosen the two eccentric stop mounting screws and rotate the eccentrics away from the brackets. Loosen the contact bracket mounting screws and position the bracket. Tighten the mounting screws. Rotate the eccentrics so they make contact with the bracket and tighten the screws which mount the eccentrics.
- (3) Bend the tangs of the booster springs until there is a clearance of .005" to .060" between the booster springs and their associated studs.

TRANSMITTER CONTACT BRACKET AND BOOSTER SPRINGS FINAL ADJUSTMENT (Figure 72)

With the slide levers in their SPACING (lower) position, the stud gap should be .030 to .035". To adjust, position the contact bail eccentrics.

TRANSMITTER CONTACT BOOSTER SPRING TENSION ADJUSTMENT (Figure 72)

With the slide levers in their SPACING (lower) position, hook an 8 oz. scale on the end of each booster spring and pull at right angles to the spring. It should require 6-1/2 to 7-1/2 ozs. to just move the tangs of the booster spring away from its associated bakelite barrier of the comb. To adjust, bend the booster spring.

TRANSMITTER BIFURCATED (SPLIT) CONTACT SPRING TENSION ADJUSTMENT (Figure 72)

With the sliding levers in their SPACING (lower) position, place a gram scale on the end of each side of the bifurcated contact spring. It should require 18 to 25 grams to just move the short studs away from their associated contact bail eccentrics. To adjust, bend the bifurcated contact springs.

TRANSMITTER CONTACT GAP ADJUSTMENT

- (1) With the slide levers in their SPACING (lower) position, the contacts should **MAKE** when a .035" gauge is placed between the contact bail eccentrics and their associated studs.
- (2) With the slide levers in their SPACING (lower) position, the contacts remain open when a .030" gauge is placed between the contact bail eccentrics and their associated studs. To adjust, bend the tangs on the solid contact springs.

TRANSMITTER CONTACT SPRING TENSION ADJUSTMENT (Figure 72)

With the sliding levers in their SPACING (lower) position, place a gram scale to the end of each solid contact spring. It should require 30 to 50 grams to just move the tang away from its associated barrier. To adjust, bend the solid contact springs.

LINE AND SELECTOR CIRCUITS CLOSING JACK ADJUSTMENT (Figure 73)

In order to check the following adjustments, the line relay must be removed and the unit should be resting on its rear supports:

CONTACT GAP ADJUSTMENT

- (1) When the jack plunger is held flush with the top surface of the base casting, there should be a gap of .010" to .015" between the contact points of the No. 3 and No. 4 contact springs. See Figure 73A. To adjust, bend the No. 3 contact spring.
- (2) When the jack plunger is held flush with the top surface of the base casting, there should be a gap of .020" to .025" between the contact points of the No. 1 and No. 2 contact springs. See Figure 73A. To adjust, bend the No. 2 contact spring.

In order to check the following adjustments, the LINE AND SELECTOR CLOSING JACK assembly must be removed from its mounting.

CONTACT SPRING TENSION ADJUSTMENT

- (1) When an 8 oz. scale is hooked to the contact springs No. 1 or No. 4 and pulled at right angles to the spring, it should require a pull of 5 to 7 ozs. to separate the contact points of No. 1 and No. 2 or of No. 3 and No. 4 contact springs, respectively. See Figure 73B. To adjust, bend the No. 1 and No. 4 contact springs.
- (2) Replace the LINE AND SELECTOR CLOSING JACK assembly on the base and tighten the mounting screws. The jack plunger should move freely in its guide and the hole in the base casting. To adjust, loosen the mounting screws and position the assembly. Tighten the mounting screws.

AUXILIARY RELAYS ADJUSTMENT

CONTACT SPRING AND ARMATURE HINGE POSITION

The contact springs and hinge bracket should be positioned to meet the following requirements:

- (1) The contacts on the relays should line up within the limits shown in Figure 71.
- (2) The spring tangs should rest on the spool head so that the free end of the tang extends back of the front face of the spool head. See Figure 75.
- (3) The width of each spring tang should lie entirely within the projection of the top and bottom edges of the slot in the spool head, but the tang should not rub on the spool head when moved from its normal position of rest on the spool head in the direction of travel of the spring. See Figure 75.
- (4) The hinge pins should not bind in the holes of the hinge brackets. See Figure 74.
- (5) With the A springs (See Figure 76) approximately equal (if not, adjust per paragraph (1) of CONTACT SPRING TENSION), both legs of the armature should bear against the hinge bracket when the relay is in the operated position and shall also bear against the hinge bracket when the relay is unoperated.

To adjust, loosen the contact spring mounting screws slightly and position the springs and hinge brackets. Tighten the mounting screws.

ADJUSTING STUD CLEARANCE

There should be some clearance between the armature and the adjusting stud over the entire armature travel. To adjust, bend the stud with a pair of long nose pliers. See Figure 74 for location of parts.

ADJUSTING NUT TIGHTNESS

The adjusting nut should be sufficiently tight on the stud to prevent it being readily turned with the thumb and forefinger. To adjust, back off the adjusting nut from the stud until its slotted portion is free of the stud, then force the slotted parts of the nut closer together, using a pair of long nose pliers. See Figure 74 for location of parts.

ARMATURE TRAVEL ADJUSTMENT (Figure 74)

There should be .041" to .047" clearance between the armature stop pin and the relay core. To adjust, turn the adjusting nut.

CONTACT SPRING TENSION (Figure 76)

- (1) The A springs should hold the armature against the adjusting nut. It should require a pressure of 20 to 45 grams applied to the back of the armature at a point approximately midway between the stop pins to start the armature moving away from the adjusting nut. To adjust, bend the A contact springs.

- (2) The C contact springs should be tensioned so that it requires a pressure of 30 to 35 grams (applied to the tip just in front of the contacts) to start the tang of each spring moving away from the side of the slot in the spool head next to the armature. (The C contact next to the A springs should be measured with the armature in the operated position.) To adjust, bend the C contact springs.
- (3) The B contact springs should be tensioned toward the armature so that it requires a pressure of 20 to 40 grams (applied to both prongs at the tip of the spring) to start its contacts moving away from its associated C break contacts. To adjust, bend the B contact springs.

STUD GAP ADJUSTMENT

With the armature unoperated, there should be at least .006" clearance between the end of the armature operating stud and the B spring. To adjust, bend the associated C break contact spring tang and recheck its spring pressure. Recheck the adjustment in paragraph (3) of CONTACT SPRING TENSION.

CONTACT SEQUENCE

On BREAK-MAKE contacts of the spring combinations, the normally closed contacts should break before the normally open contacts make. Gauge by eye. To adjust, modify the spring tensions, stud gaps, and contact adjustments as required.

CONTACT MAKE ADJUSTMENT

Both contacts of the B bifurcated springs should make with their associated C BREAK contact spring when the armature is in the unoperated position. They should also make contact with their associated C MAKE contact springs when the relay is electrically energized. To adjust, bend the ends of the springs (obtain by bending only the ends of the B contact springs if possible). Recheck adjustments in paragraphs (2) and (3) of CONTACT SPRING TENSION, and STUD GAP ADJUSTMENT.

CONTACT SPRING TESTS

Each of the A and B contact springs should meet the following requirements:

- (1) With the relay electrically energized against a .016" thickness gauge inserted between the armature and the core, none of the MAKE contacts should make contact with a mating contact on the associated C MAKE contact spring.
- (2) With the relay electrically energized against a .009" thickness gauge inserted between the armature and the core, at least one of the MAKE contacts on each B and C contact spring should make contact with its mating contact on the associated C MAKE contact spring.
- (3) With the relay electrically energized against a .005" thickness gauge inserted between the armature and the core, both BREAK contacts on each B spring will be separated from their mating contacts.

To adjust, bend the tang on the associated C contact springs and recheck adjustment in paragraph (2) of CONTACT SPRING TENSION.

SYNCHRONOUS MOTORS-STARTING SWITCH ADJUSTMENTS

The following requirements should not be checked unless there is reason to believe that the starting switch is out of adjustment.

- (1) Remove the motor unit from the base and remove the motor fan and pinion.
- (2) Remove the switch end shield screws and the switch commutator mounting screws. Remove the switch end shield.
- (3) Pull out the rotor until the brush holder spring is accessible and remove the spring.
- (4) The tension of the spring for 60 cycle motors should measure 3 to 3-3/4 ozs. when extended to a length of five inches, using an 8 oz. scale. The tension of the spring for 50 cycle motors should measure 1-1/2 to 2-1/2 ozs. when extended to a length of five inches, using an 8 oz. scale.
- (5) The brush holders should be mounted by means of the center set of mounting holes and should be free.
- (6) The brush holder stop pins should be safely within the holes of the fibre disc when all the play in the brush holders has been taken up to make the engagement of the pins with the disc a minimum.
- (7) Replace the brush holder spring, making certain that the spring eyes are fully engaged with each other.
- (8) Replace the switch commutator screws and tighten the two screws alternately, a little at a time, until both screws are tight.
- (9) Replace the switch end shield screws, using the same precaution in tightening as above.
- (10) Apply the push end of a 12 lb. scale against the fan end of the shaft and push parallel to the shaft. It should require at least 7 lbs. pressure to start the shaft moving.
- (11) Replace the motor fan and pinion. Replace the motor on the base and remake the motor position adjustments.

GOVERNOR ADJUSTMENTS

SPEED ADJUSTING WHEEL FRICTION WASHER ADJUSTMENTS (Figure 77) See Note (D)

In order to check this adjustment, it will be necessary that the speed adjusting spring be adjusted so that it requires a pull of 13 to 14 ozs. to separate the governor contacts. To measure, hook a 32 oz. scale over the

* * *

- (D) This requirement should be checked with the governor adjusting bracket, the brush spring plate, the governor cover and target removed

contact spring next to the contact and pull parallel to the speed adjusting spring. Adjust to the proper tension by means of the speed adjusting wheel.

Insert a bank pin radially in the leather of the adjusting wheel, hook a 32 oz. scale over the pin at the periphery of the wheel and pull at right angles to the radius. It should require 16 to 24 ozs. to start the wheel moving. To adjust the friction, remove the friction washer and bend the large projections.

INNER AND OUTER DISC CONTACT SPRING ADJUSTMENT (Figure 78) See Note (D)

- (1) The distance from the inner surface of the governor cover to the highest point on the contact springs should be $25/32''$ to $27/32''$.
- (2) Place a D socket wrench over the nut located in the center of the governor cover. With a six inch scale, measure the radial distance from the vertical surface of the wrench to the point where the scale touches the curved surface of the inner disc contact spring. This distance should be $17/32''$ to $19/32''$.
- (3) In a similar manner, measure the distance from the wrench to the point of contact on the outer disc contact spring. This distance should be $7/16''$ to $1/2''$. To adjust, bend the inner and outer disc contact springs.

GOVERNOR SHIMS ADJUSTMENT See Note (D)

With the governor speed adjusting lever in its unoperated position, there should be at least $.006''$ clearance between the wearing strip and the adjusting wheel when the adjusting wheel is opposite the wearing strip and all the end thrust of the motor armature is taken up in a direction to make this clearance a minimum. Adjust by increasing or decreasing the number of shims on the armature shaft between the governor hub and the end frame casting of the motor. See Figure 80 for location of parts.

SPEED ADJUSTING LEVER STOP PLATE ADJUSTMENT

There should be $.006''$ to $.050''$ clearance between the speed adjusting lever wearing strip and the governor shell when the speed adjusting lever is held against the stop plate. To adjust, loosen the stop plate mounting screws and position the plate. Tighten the screws. See Figure 80 for location of parts.

GOVERNOR BRUSH SPRING PLATE BRACKET ADJUSTMENT (Figure 79)

- (1) A line established by the center of the outer disc and the center of one of the brushes should pass through some portion of the other brush.

* * *

- (D) This requirement should be checked with the governor adjusting bracket, the brush spring plate, the governor cover and target removed.

- (2) The surface of the brush spring plate bracket on which the brush spring plate is mounted should be in line with the outer surface of that part of the governor cover on which the target is mounted.
- (3) The bracket should be parallel to the edge of the motor base plate.

To adjust, position the brush spring plate bracket by means of its enlarged mounting holes.

GOVERNOR BRUSH SPRING PRESSURE ADJUSTMENT (Figure 80)

- (1) The carbon brushes should exert a pressure of 4-1/2 to 5-1/2 ozs. against their associated discs. To measure, apply an 8 oz. scale to the spring near the carbon brush and push or pull horizontally until the brush starts to move away from the disc.
- (2) Both carbon brushes should lie flat against their associated discs and the outer edges of the brushes should be flush with, or not more than 3/64" inside of, the outer edges of the discs.

To adjust for these requirements, remove the brush springs and bend them if necessary. Reinstall springs and position them properly. Tighten the screws.

NOTE: If necessary, level off the brushes by passing a piece of No. 0000 sandpaper between the brush and the disc.

GOVERNOR ADJUSTING BRACKET ADJUSTMENT (Figure 80)

The adjusting surface of the governor adjusting bracket should clear the speed adjusting wheel by .020" to .060". Bend the governor adjusting bracket if necessary to secure this clearance.

MAIN BAIL SPRING TENSION **

The printing blow, i.e., the force with which the type bars strike the platen, and the force required for shifting the platen shaft assembly from the FIGURES to the LETTERS position, is regulated by the main bail spring adjusting screw. This adjusting screw is located just to the left of the clutch throw-out lever upper pilot screw, which is shown in Figure 4.

With the motor running, send alternate LETTERS and FIGURES signals to the REPERFORATOR TRANSMITTER unit. Loosen the lock nut and back off the main bail spring adjusting screw until the platen fails to return to the LETTERS position. Then turn the screw in a clockwise direction until the platen just moves to the LETTERS and FIGURES positions without any failures. Turn the screw clockwise an additional 1-1/2 turns and tighten the lock nut. With the main shaft clutch disengaged and a 25 lb. scale hooked to the spring adjusting lever directly below the spring hole, it should require not more than 15-1/2 lbs. to start the spring adjusting lever moving.

* * *

** FRXD4 only.

MAIN BAIL CAM CLUTCH TORQUE (Figure 81)

This torque should be measured after the motor has been running at least ten minutes with the main bail cam stationary. Press downward on the main bail so as to move the main bail cam roller away from its cam and at the same time hold the punch arm cam roller away from its cam. With a 32 oz. scale hooked into the screw hole on top of the main bail cam, pull at right angles to the radius of the main bail cam. It should require a pull of 18 to 24 ozs. to start the cam moving in a direction opposite to its normal direction of rotation.

SELECTOR CLUTCH TORQUE (Figure 82)

This torque should be measured after the motor has been running at least ten minutes with the selector cam sleeve stationary. Hook a 32 oz. scale to the selector cam sleeve stop arm and pull at right angles to the cam sleeve stop arm. It should require a pull of 14 to 18 ozs. to hold the selector cam sleeve stationary. This clutch torque depends on the condition of the felt friction washers and the friction clutch spring. If difficulty is encountered in securing the specified torque, shims may be placed at the lower end of the friction clutch spring. The selector cam sleeve must be removed from the shaft in order to insert the shims. Shims are available under the following numbers:

96763	SHIM	(.012")
96764	SHIM	(.016")
96765	SHIM	(.020")

LUBRICATION

GENERAL

The oil and grease specified in the supplement furnished with this bulletin should be used to lubricate the REPERFORATOR TRANSMITTER DISTRIBUTOR.

Unless otherwise specified, one or two drops of oil at each of the places indicated will be sufficient. Use oil for lubrication at all of the places listed, except where the use of grease or oil-grease-oil is specified.

NOTE: Oil both loops of all helical springs that exert a nominal tension of less than 2-1/2 lbs. Apply grease to both loops of all helical springs that exert a nominal tension of 2-1/2 lbs. or more.

SELECTOR MECHANISM

NOTE: Be careful not to get oil between the pole faces of the selector magnet and the magnet armature.

- (1) Armature lever - 2 pivot screws.
- (2) Selector arm - 2 pivot screws, 2 sword contact points, locking tip, and point of contact with operating screw.
- (3) Selector arm detent - bearing, and point of contact with selector arm.
- (4) Range Finder Assembly
 - a. Trip latch plunger - bearing, and 2 points of contact.
 - b. Bell crank - bearing.

- c. Trip latch - bearing, and points of contact.
- d. Stop lever - bearing and point of contact with stop arm.
- (5) Swords and selector levers - drop oil between separator plates.
- (6) Selector "T" levers - all points of contact.
- (7) Selector arm locking lever - at pivot.
- (8) Selector cam sleeve - each cam peak.
- (9) Code bars - at posts.
- (10) Tape feed-out lever - 4 bearings, point of contact with trip latch plunger.

MAIN SHAFT

Remove range scale rear mounting screw, swing scale out of the way and fill shaft through hole in center of retaining disc. Replace range scale and its rear mounting screw.

- (1) Locking lever cam felt oiler - saturate.
- (2) Selector cam friction washers (2) - saturate.
- (3) Main cam friction disc - saturate.
- (4) Main shaft ball bearings (2) - grease.
- (5) Clutch throwout lever - 2 bearings, grease end of lever.
- (6) Clutch - oil freely.
- (7) Compression springs (3) - allow oil to flow into prongs under springs.
- (8) Main shaft gear - grease.
- (9) Subshaft drive gear - grease.
- (10) Motor pinion - grease.
- (11) Main bail cam - grease.
- (12) Punch arm cam - grease.

MAIN BAIL

- (1) Main bail roller - oil, grease, oil.
- (2) Main bail plunger - fill oil cup and saturate oil wick.
- (3) Main bail lever - fill oil cup just above terminal block, also oil end of lever in main bail plunger.
- (4) Main bail - fill groove with oil, 2 main bail guide rollers.
- (5) Main bail roller guides (2) - grease.
- (6) Main bail adjusting screw - grease end of screw.
- (7) Main bail spring anchor - grease.
- (8) Main bail lever spring post (8) 90752 felt washers - saturate.

PULL BARS, TYPE BARS, AND CODE BARS

- ** (1) Pull bars - one drop of oil on top of each bar.
- ** (2) Type bar gears - pull each type bar down against platen and put drop of oil on top of type bar gear at rear of segment slot.
- (3) Code bar locking lever - grease lever at point of contact with main bail.
- (4) Code bars - slots and posts, one drop to each code bar.

* * *

** FRXD4 only.

RIBBON MECHANISM **

- (1) Ribbon feed ratchet and feed gears - oil teeth.
- (2) Ribbon feed shaft detent plunger.
- (3) Ribbon feed shaft - 2 oil holes.
- (4) Ribbon feed lever - oil hole.
- (5) Ribbon feed lever roller - bearing.
- (6) Ribbon spool shaft (right) - 2 bearings.
- (7) Ribbon spool shafts (left) - 4 bearings, oil teeth on gears (3).
- (8) Ribbon reverse pawls and links - 4 bearings on each side.
- (9) Ribbon reverse shafts - 2 bearings each.
- (10) Ribbon feed shaft detent - grease.

PLATEN SHIFT MECHANISM **

- (1) Platen shafts (2) - thin film of oil.
- (2) Shift lever - bearings (2), and point of contact with pull bar and platen frame.
- (3) Shift latch - bearing and points of contact with pull bars and shift bail.
- (4) Shift bail - bearing, and at platen frame extension.
- (5) Shift bail stop screw - grease.
- (6) Intermediate bail - bearing, grease at points of contact with shift bail and plunger extension bracket.

PREPUNCH MECHANISM

- (1) Prepunch arm - bearings (2).
- (2) Feed roll - bearings (2) and feed notches.
- (3) Feed pawl - bearing.
- (4) Prepunch operating bail - bearings (2), grease at eccentric and extension.
- (5) Star wheel - grease.
- (6) Feed roll detent - bearing and roller.
- (7) Feed hole punch - also at point of contact with prepunch arm.

REPERFORATING MECHANISM

- (1) Punch arm casting roller - oil, grease, oil.
- (2) Punch arm casting bearing - fill oil cup.
- (3) Punch arm extension - bearing, also at adjusting screw extension.
- (4) Code bar bell cranks - drop of oil between separator plates, point of contact at vertical links, and code bar locking lever.
- (5) Vertical links - at pivot, and comb.
- (6) Vertical links bell cranks - at pivot and point of contact with vertical link, and selector finger bell cranks.
- (7) Selector finger bell cranks - 2 places each.
- (8) Selector fingers - guide comb and point of contact with code punches.
- (9) Punch bail pilot screw - 2 bearings.
- (10) Feed pawl bearing.

* * *

* FRXD3 only.

** FRXD4 only.

- (11) Feed roll - 2 bearings.
- (12) Feed roll detent wheel - grease.
- (13) Feed roll detent - bearing and roller.
- (14) Code punches.
- (15) Code punch retracting bail - bearings (2), and points of contact with code punches.
- (16) Code punch retaining levers - at pivot and point of contact with code punches.
- *(17) Tape depressing bail - bearings (2), guide studs for weighted guide (2).
- ** (18) Tape operating bail - bearings (2).

PIVOTED TRANSMITTER AND TRANSFER MECHANISM

- (1) Transmitter lid - bearings (2).
- (2) Sensing fingers - bearings, and point of contact with guide plate.
- (3) Transmitter yoke - bearings (2).
- (4) Tape feed lever - bearings (2).
- (5) Tape feed pin lever bearing.
- (6) Feed pin oscillator - bearing and points of contact with feed pin lever and guide.
- (7) Feed pin oscillator lever - bearing, and guide comb.
- (8) Selector levers - bearing, and at guide comb 2 places.
- (9) Contact lever - bearing.
- (10) Transmitter stop contact operating plunger.

TRANSFER AND SLIDE LEVER MECHANISM

- (1) "T" levers - bearings, and at points of contact with selector levers and transfer slide levers.
- (2) "T" lever operating bail - bearings (2).
- (3) Transfer slide lever - bearings 2 each.
- (4) Contact operating bails - bearings, and grease at point of contact with transfer slide levers.

SENSING SHAFT

- (1) Sensing shaft bearings - ball bearing in front, fill oil cup in rear.
- (2) Sensing shaft - remove thumb screw from front end of shaft and fill shaft with oil.
- (3) Sensing shaft gear - grease.
- (4) Clutch assembly - oil freely.
- (5) Detent lever - bearing and roller.
- (6) Oscillator lever roller.
- (7) "T" lever operating bail roller.
- (8) Clutch lever - bearings (2) - grease end.
- (9) Thin film of grease on bearing surface of all cams.

* * *

* FRXD3 only.

** FRXD4 only.

DISTRIBUTOR SHAFT

- (1) Distributor shaft bearings - ball bearing in front, fill oil cup in rear. (Note: Oil cup should be set at a 45 degree angle with open end toward front.)
- (2) Distributor shaft. Remove thumb screw from front end of shaft and fill shaft with oil.
- (3) Distributor shaft gear - grease.
- (4) Clutch assembly - oil freely.
- (5) Detent lever - bearing and roller.
- (6) Clutch contact operating levers - at bearing and thin film of grease at point of contact with contact insulator.
- (7) Clutch lever - bearings (2) - grease end.
- (8) Distributor contact levers - bearing, grease point of contact with cams, thin film of grease on point of contact with contact insulator.
- (9) Thin film of grease on bearing surface of all cams.

NOTE: Remove all oil and grease from distributor contacts and excess oil from associated parts.

SUBSHAFT

- (1) Subshaft gears (2) - grease.
- (2) Subshaft bearings (2) - fill oil cups.

Apply a thin film of grease on the insulators of the following contacts at point of contact with their operating levers:

- (1) Transmitter stop contact.
- (2) Tape-out contact.
- (3) Distributor shaft clutch magnet contact.
- (4) Clutch magnet auxiliary contact.
- (5) Transmitter contacts.



UPPER CASE	WEATHER SYMBOLS COMMUNICATIONS																										SPACE	L.T.R. SHIFT	FIG. SHIFT						
	†	⊕	○	/	3	→	↘	↓	8	↖	·	⊙	9	∅	1	4	Δ	5	7	⊖	2	/	6	+	-	<				>					
LOWER CASE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	BLANK	C.R.	L.F.		SPACE	L.T.R. SHIFT	FIG. SHIFT		
1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
FEED HOLES	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

FIGURE 1

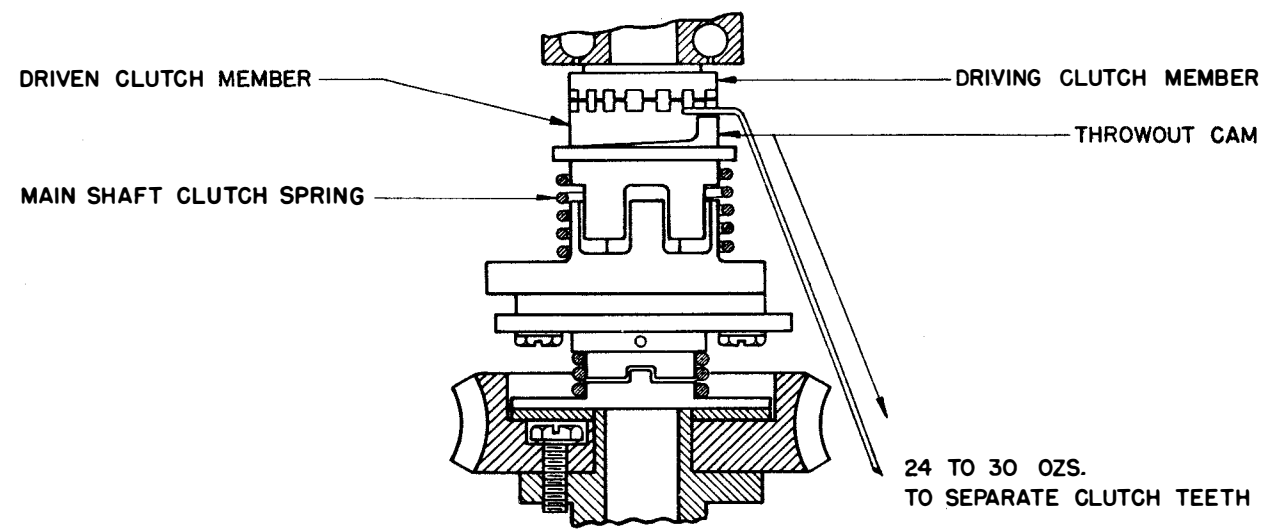


FIGURE 2

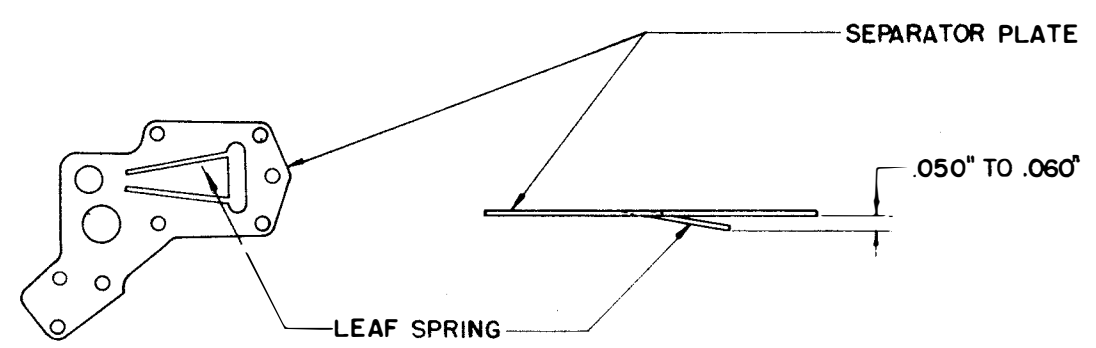


FIGURE 3

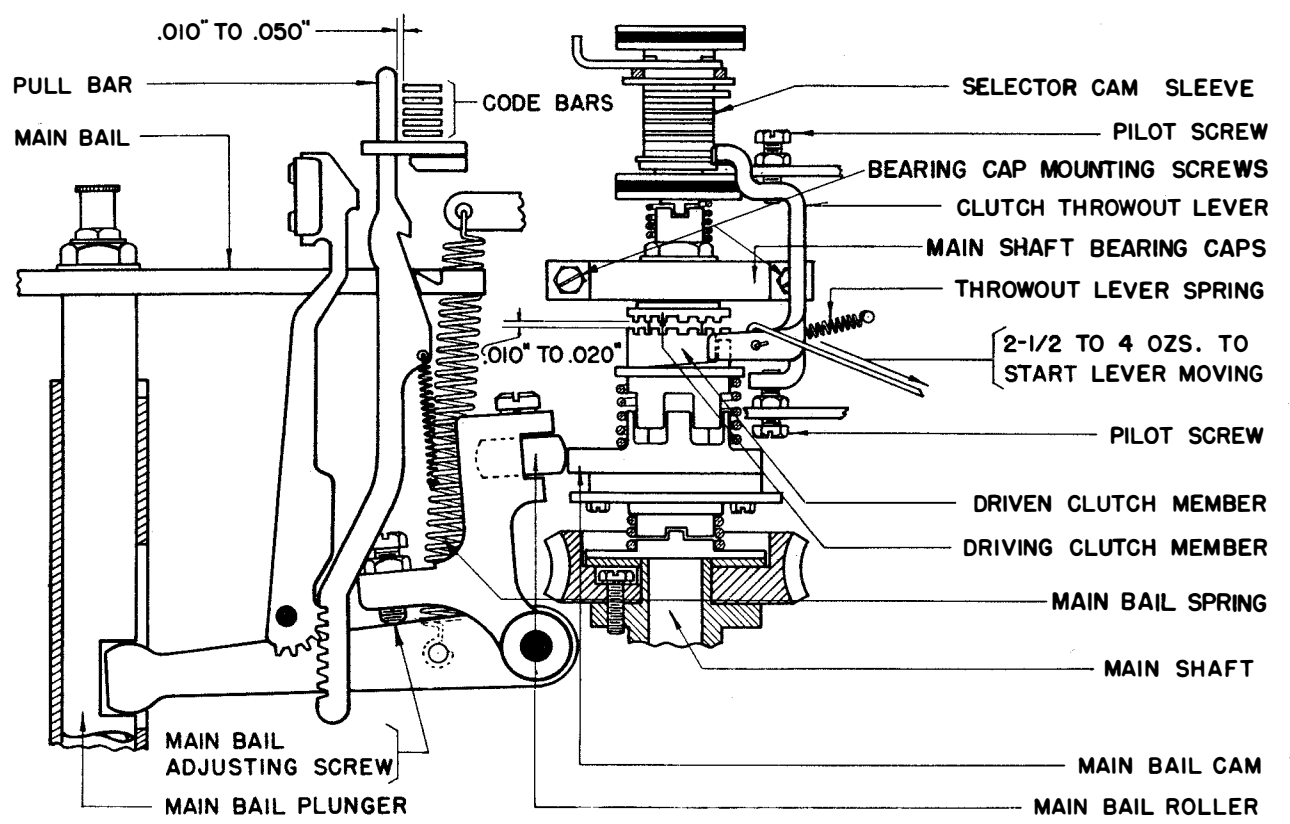


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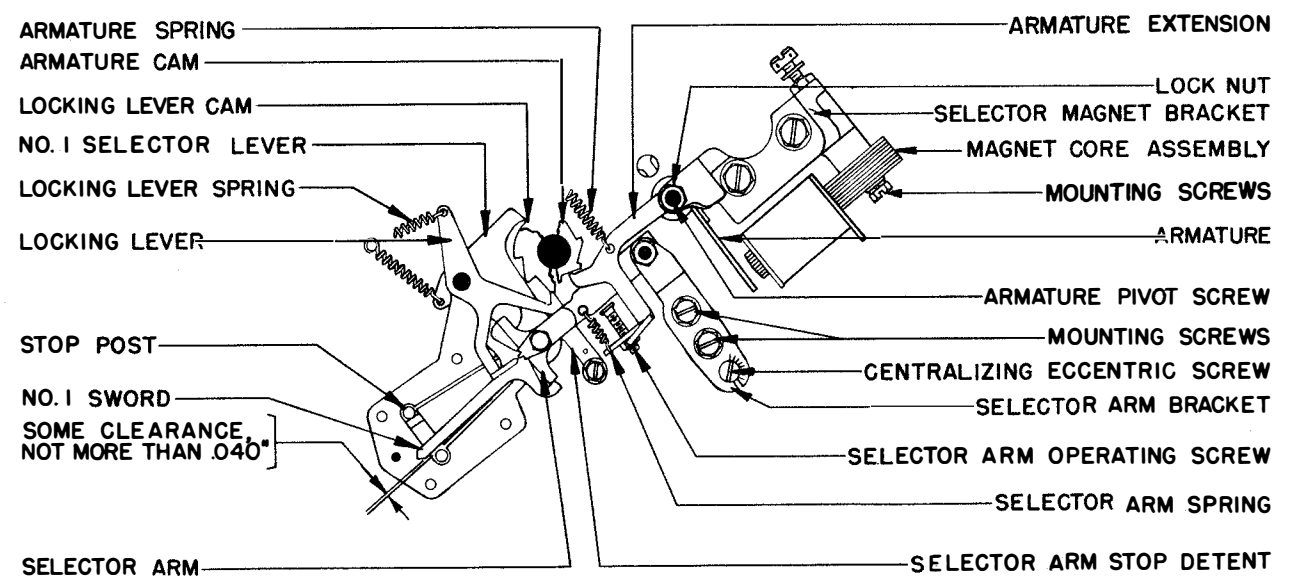


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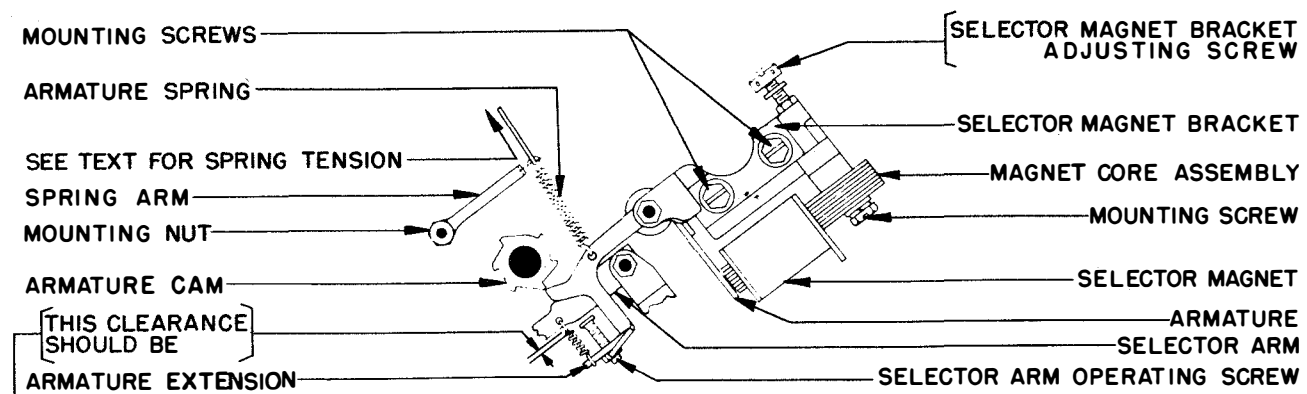


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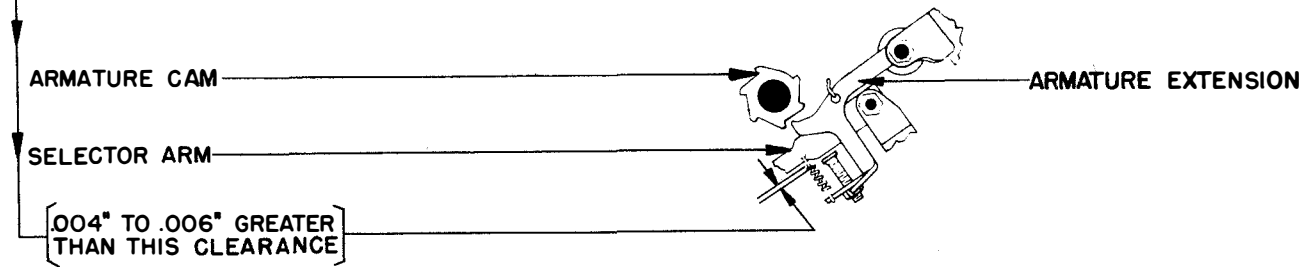


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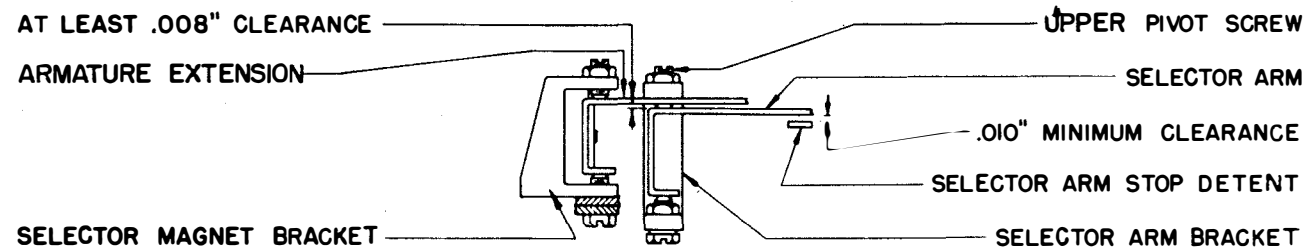


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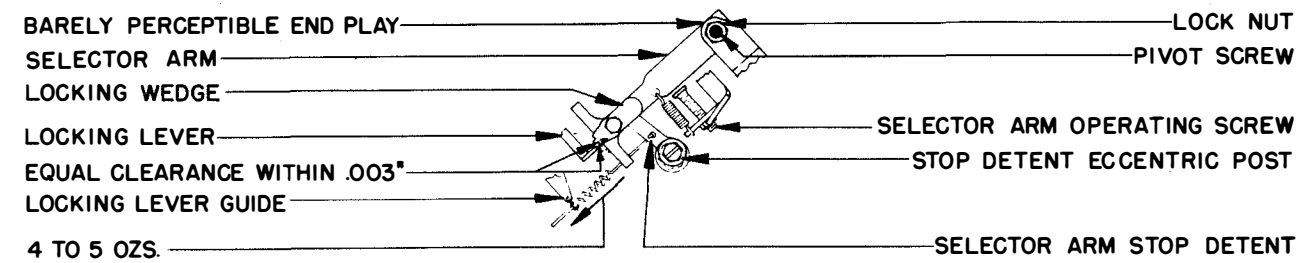


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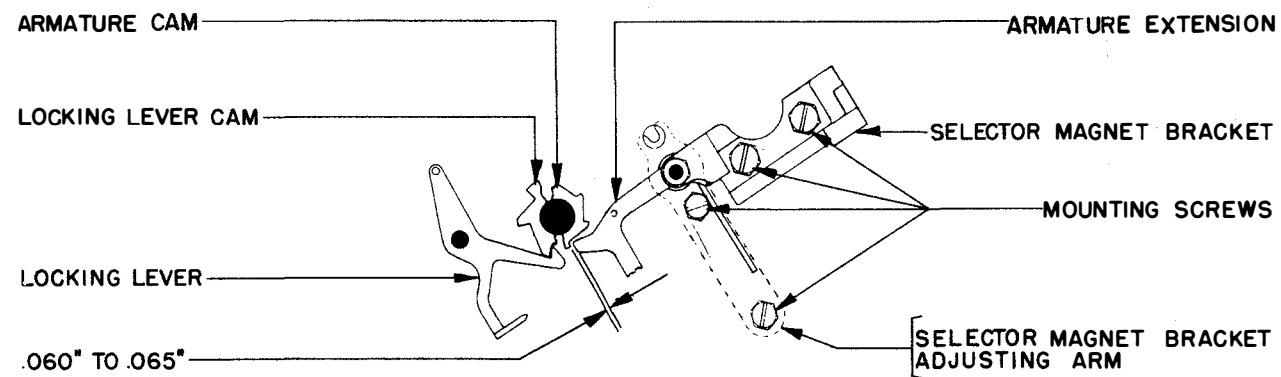
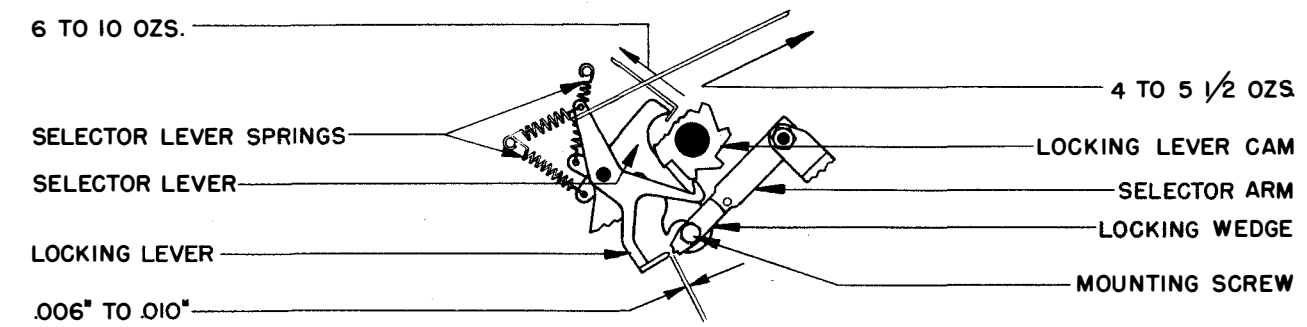


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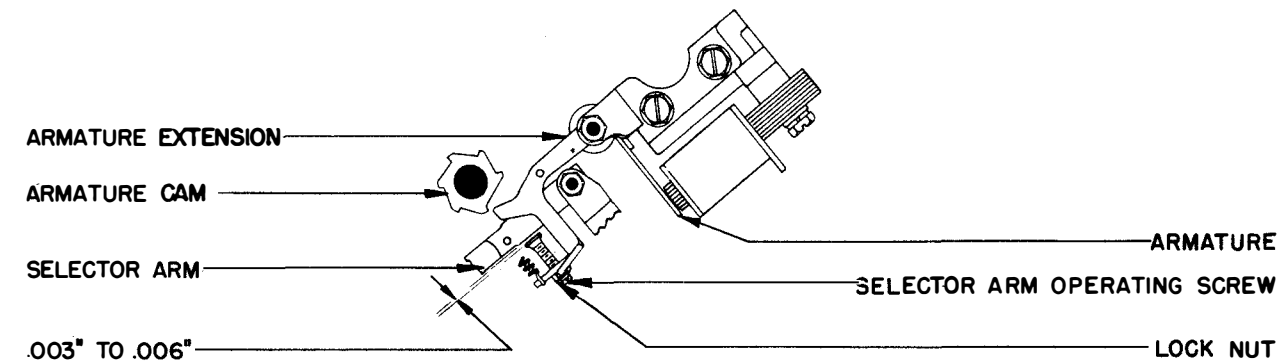


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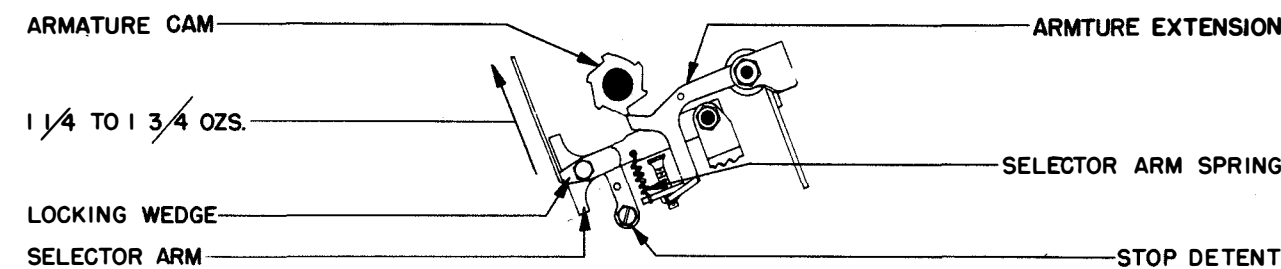


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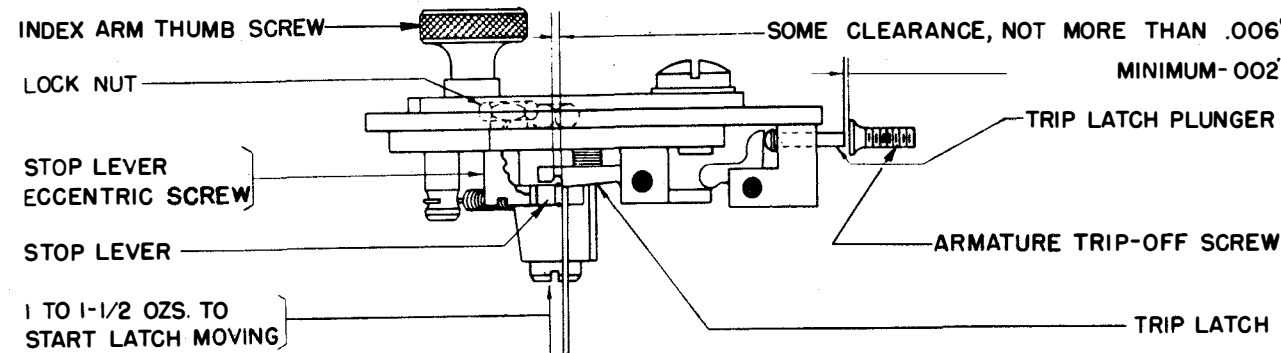


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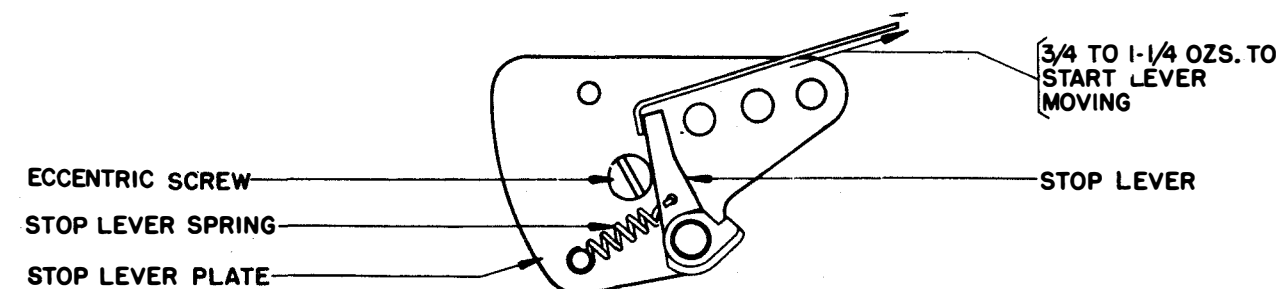


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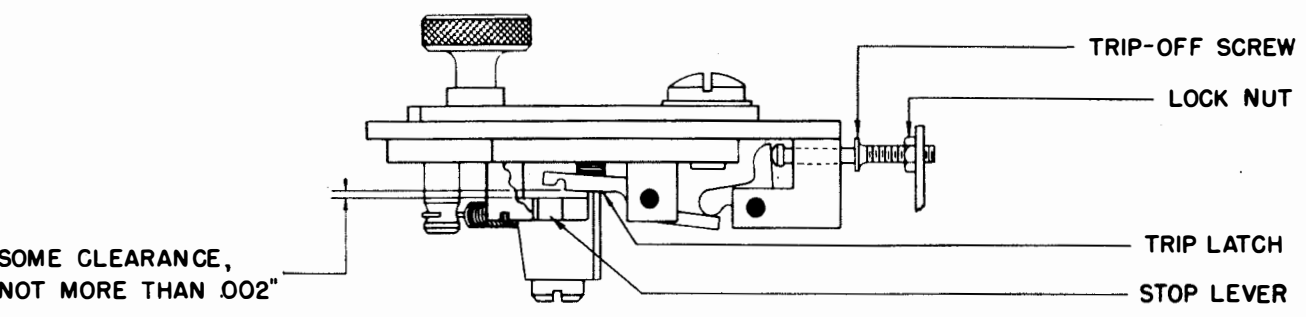


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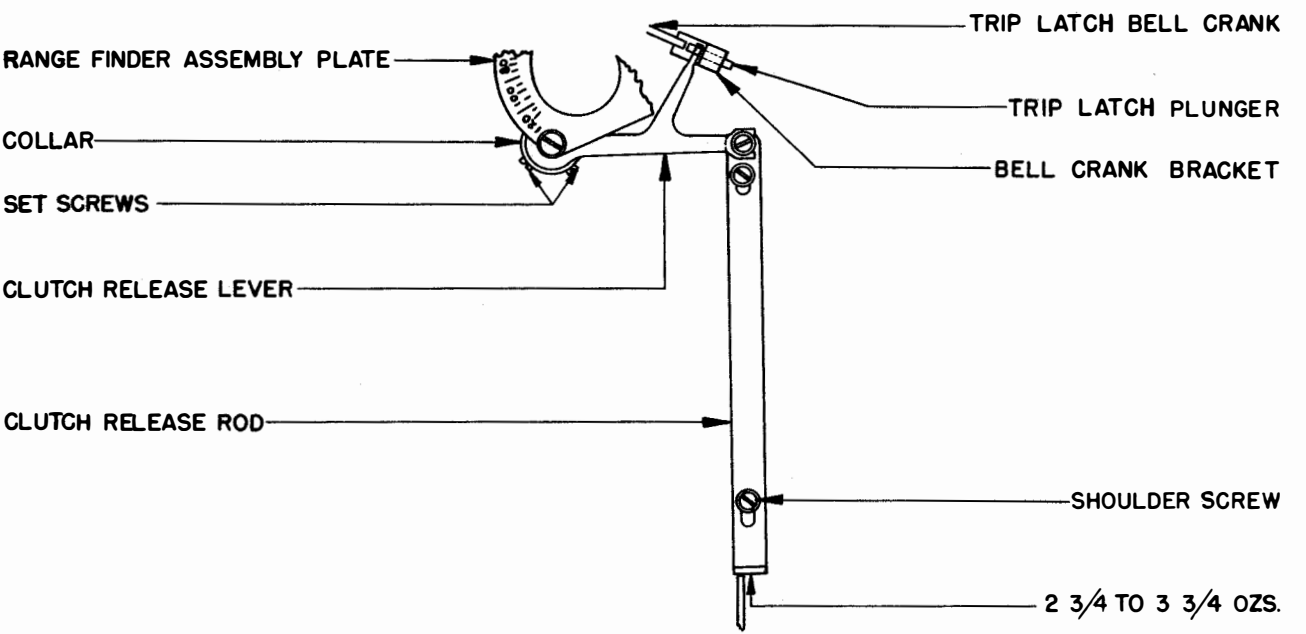


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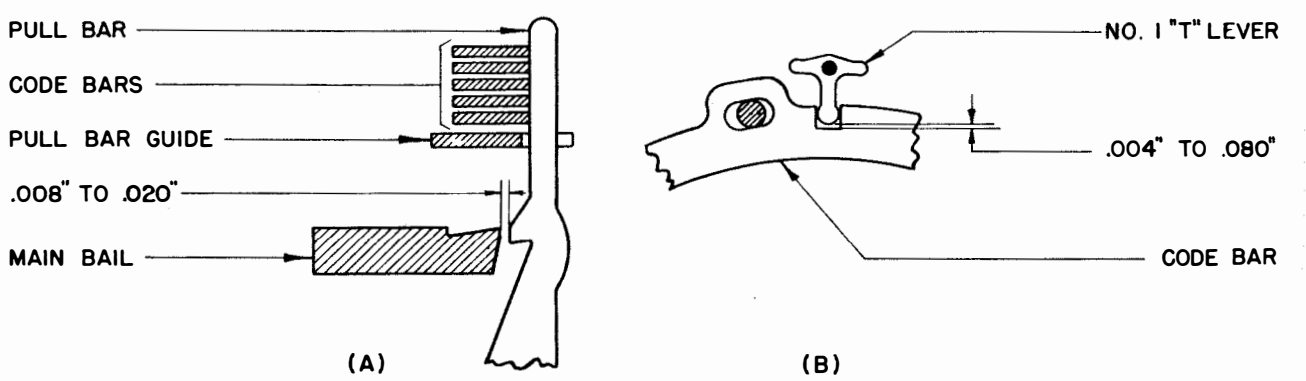


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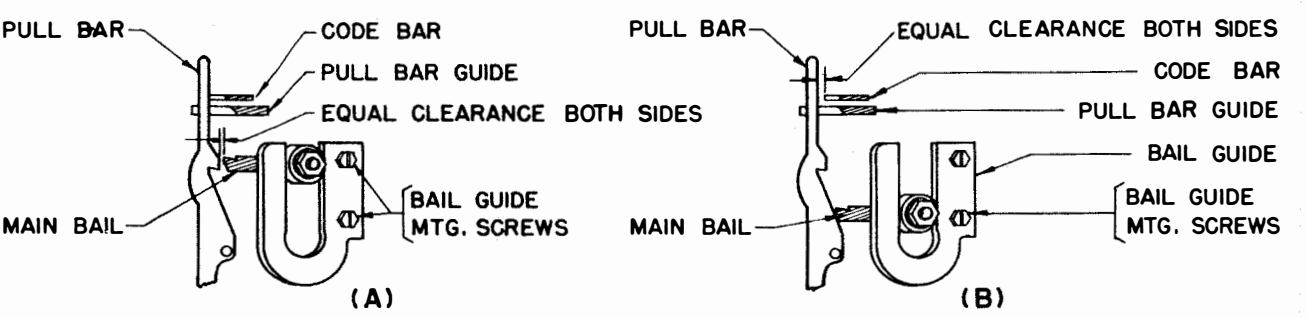


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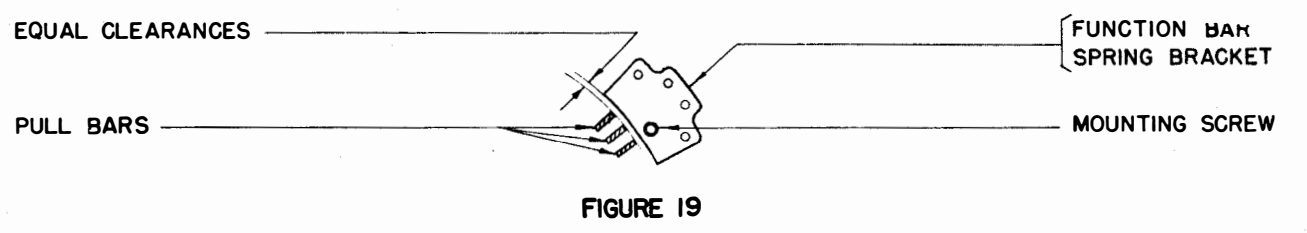


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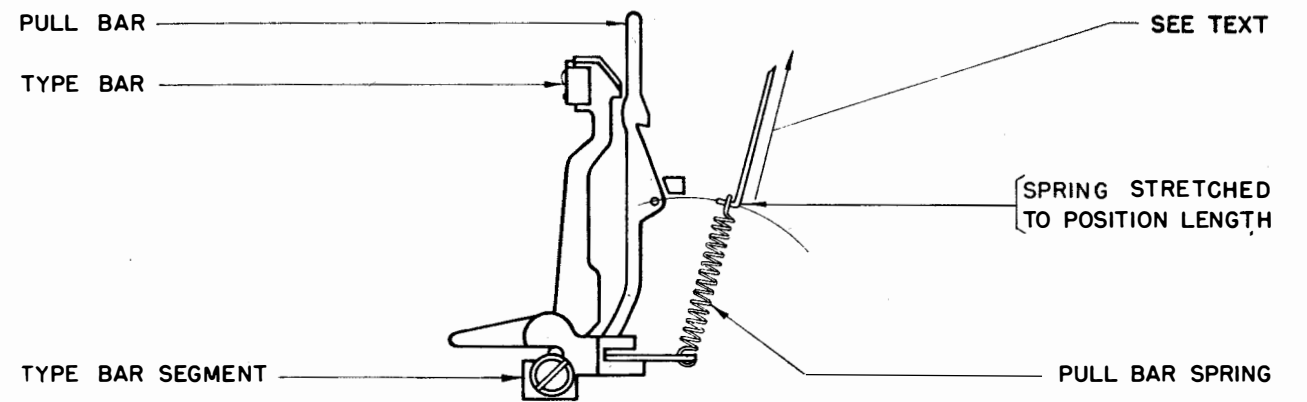


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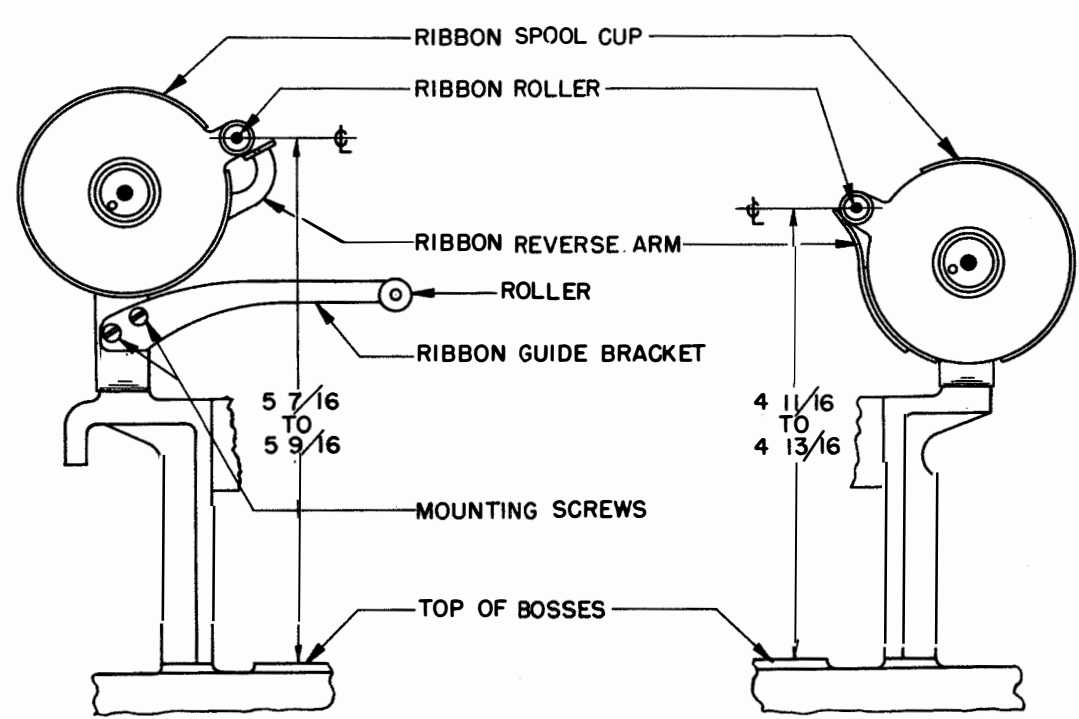


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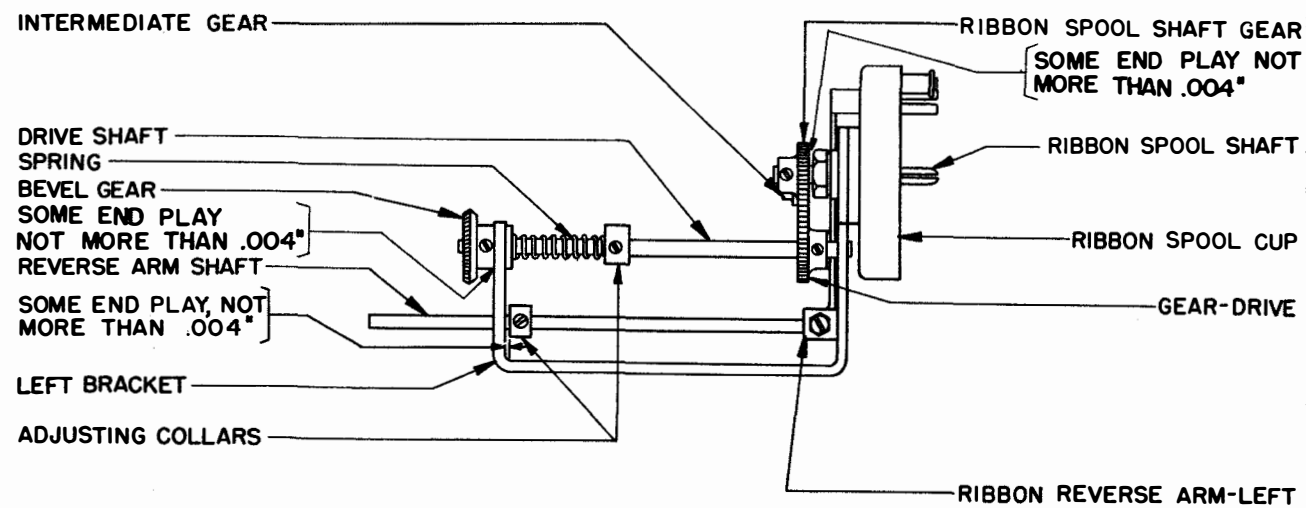


FIGURE 22

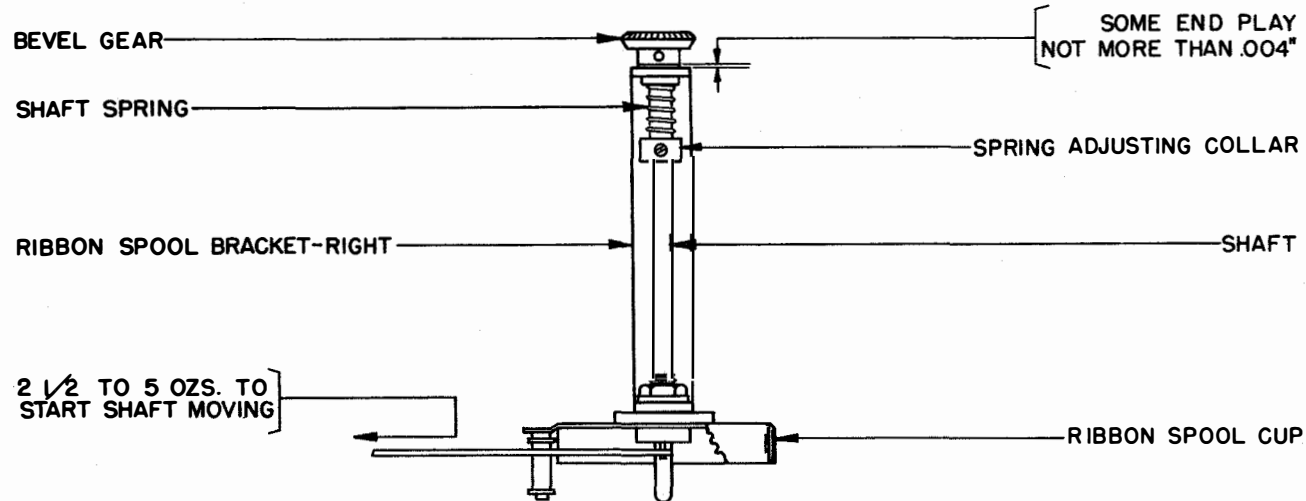


FIGURE 23

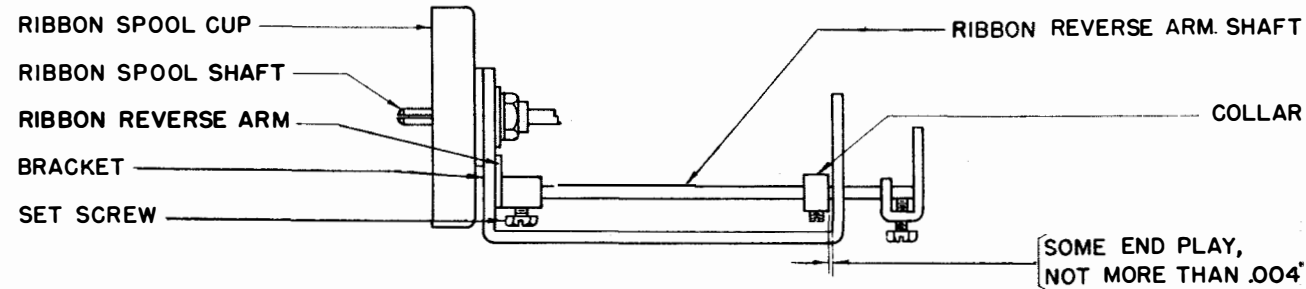


FIGURE 24

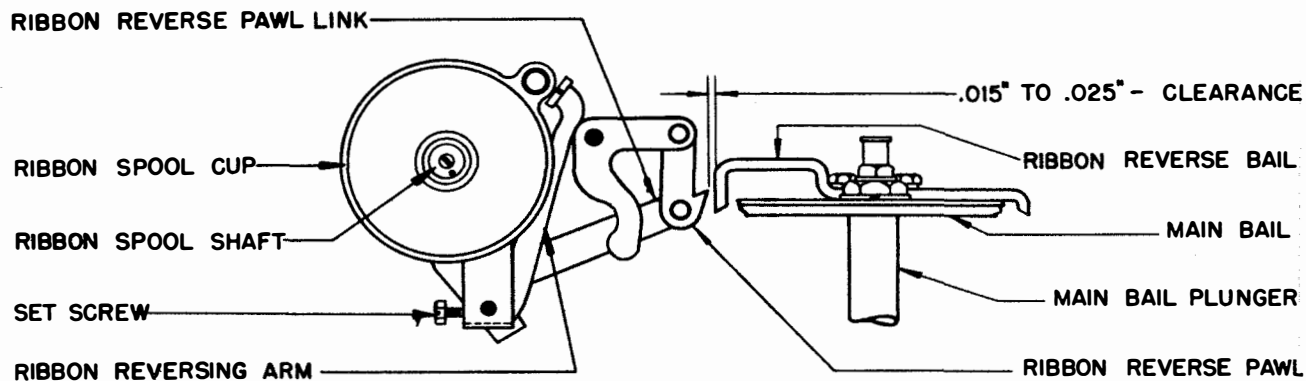


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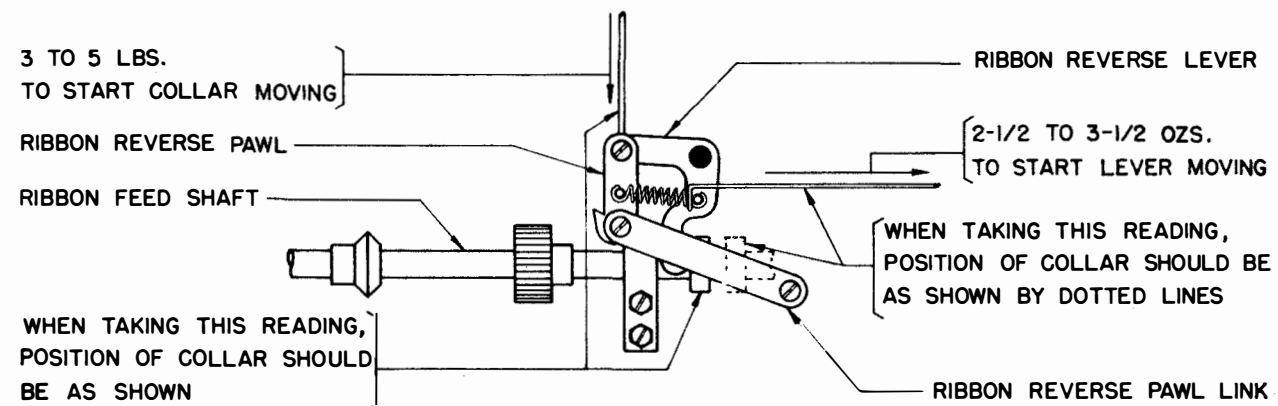


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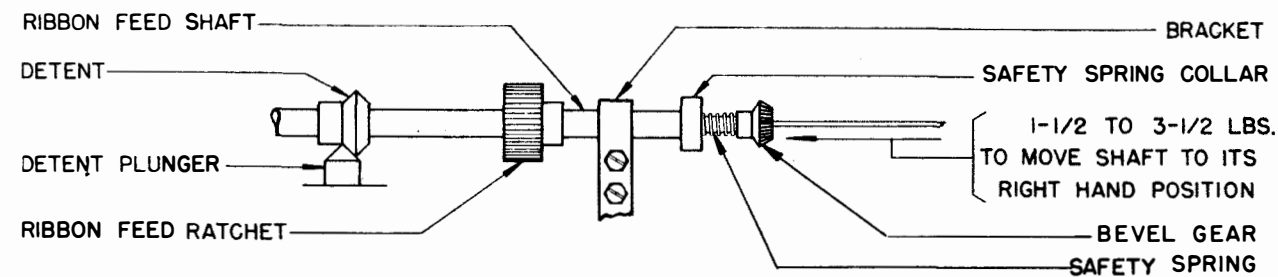


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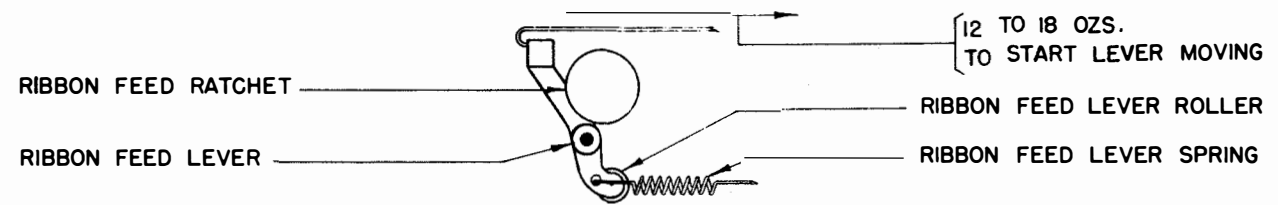


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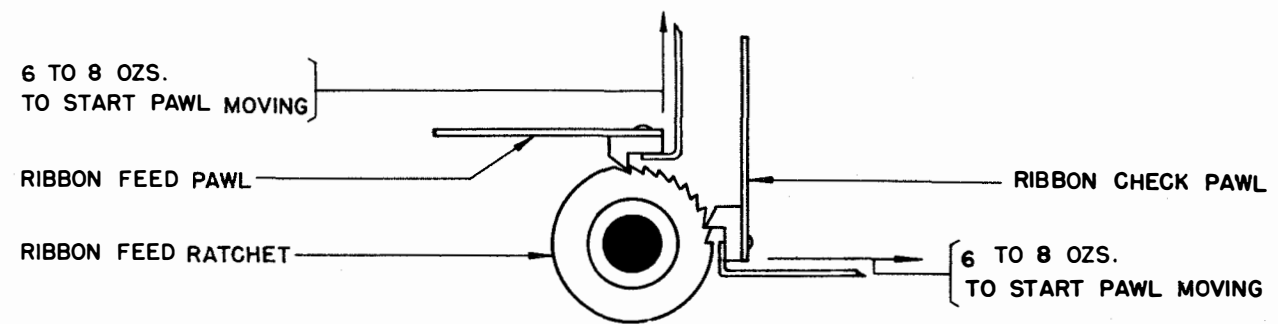
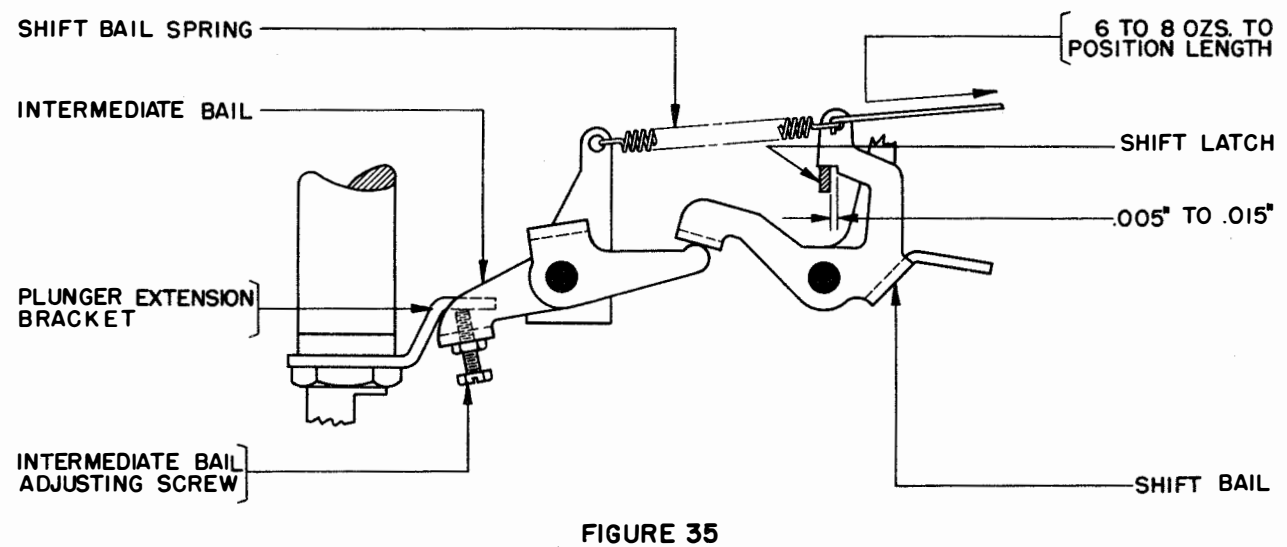
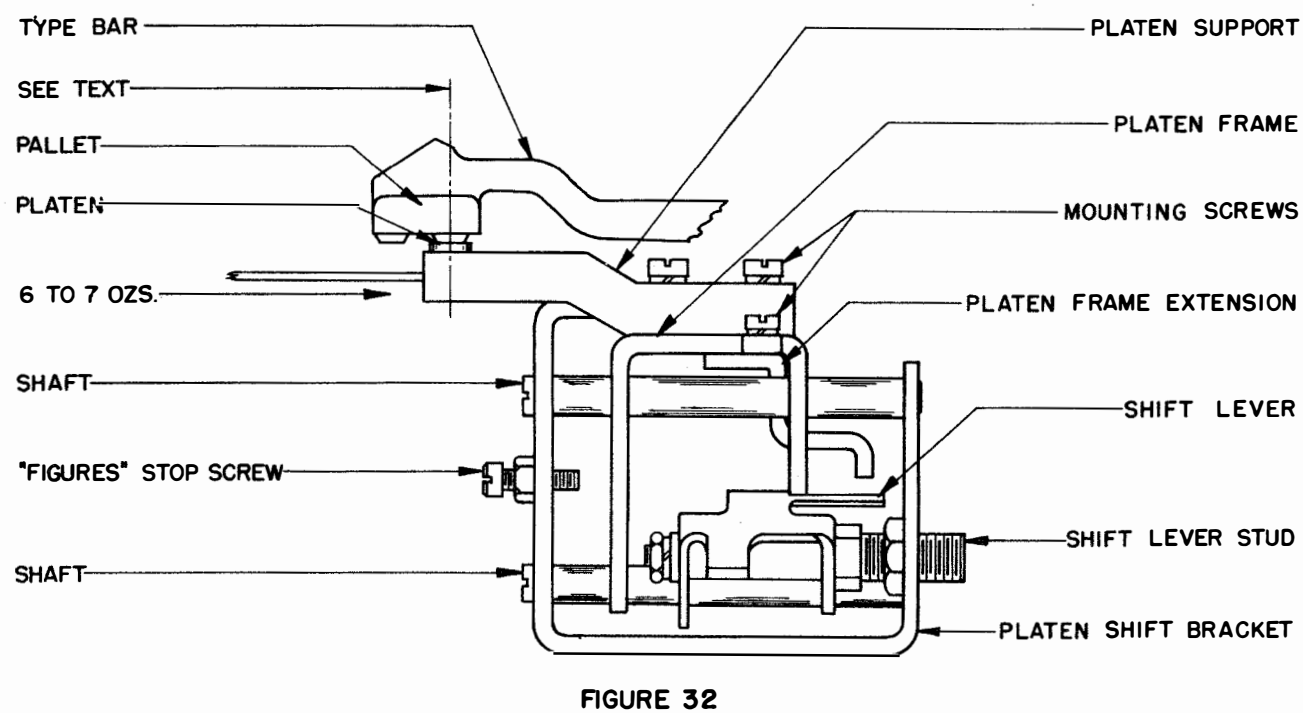
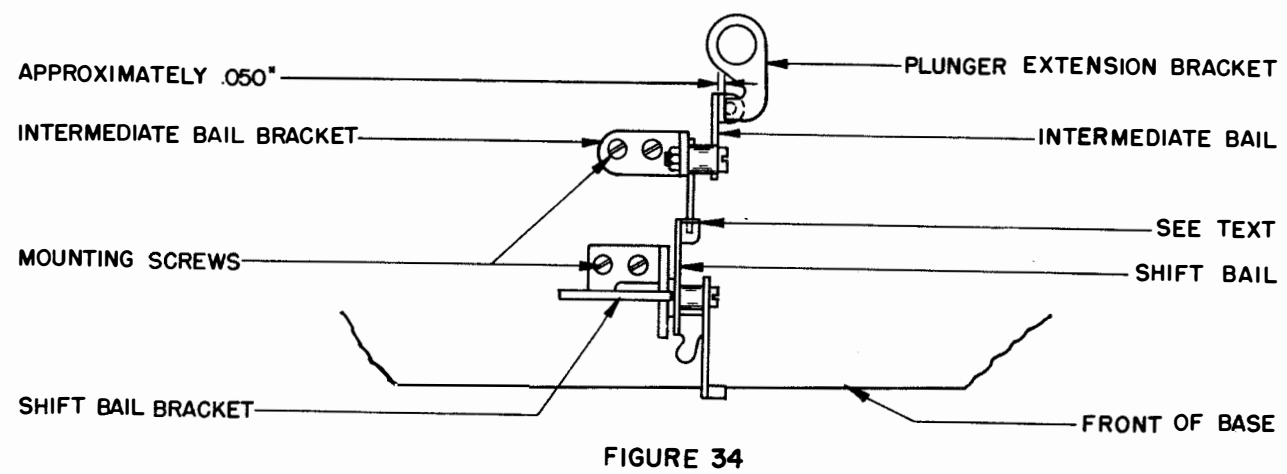
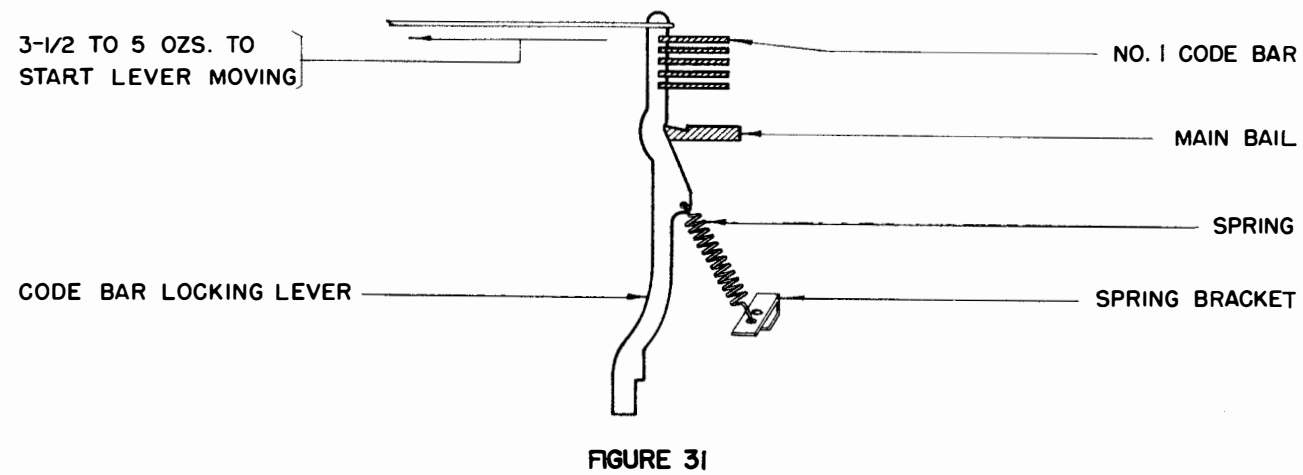
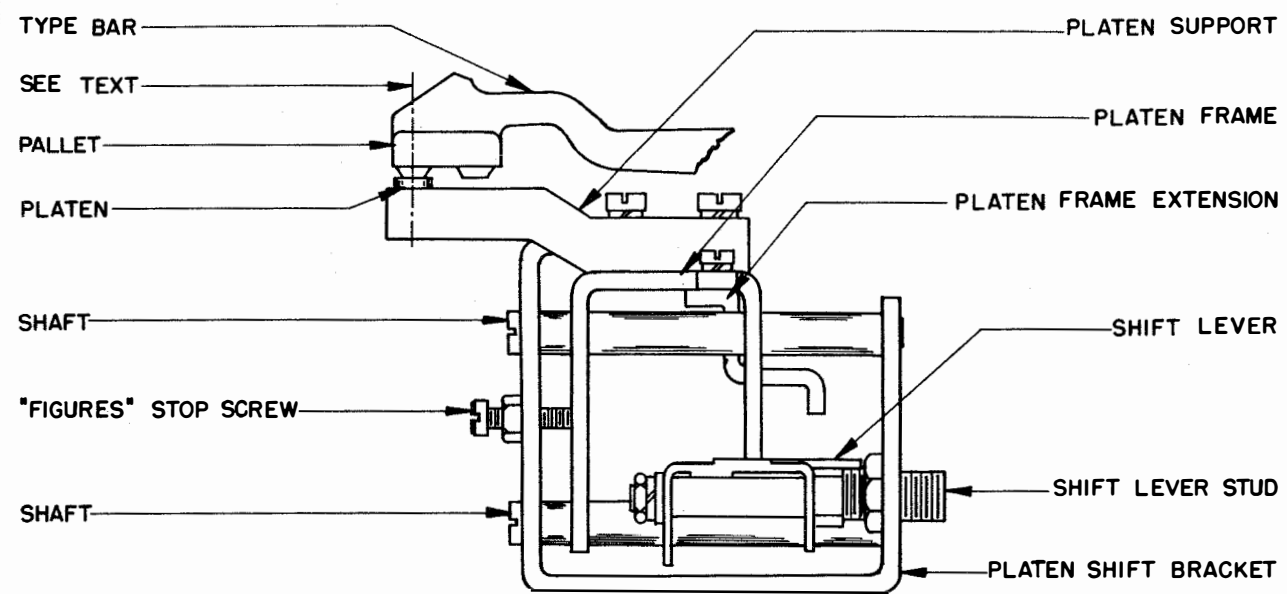
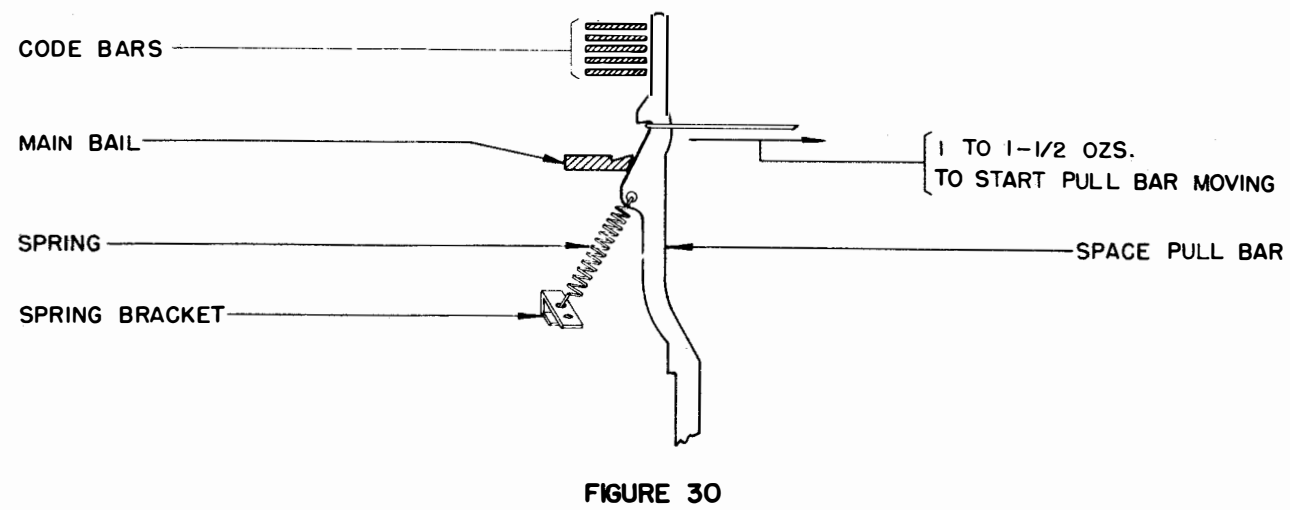


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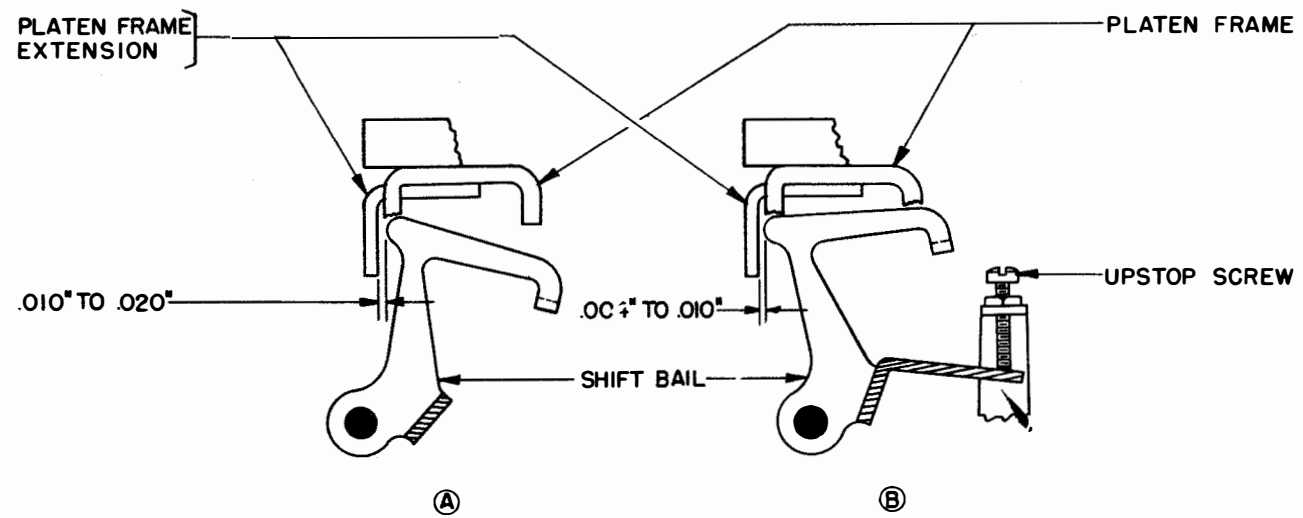


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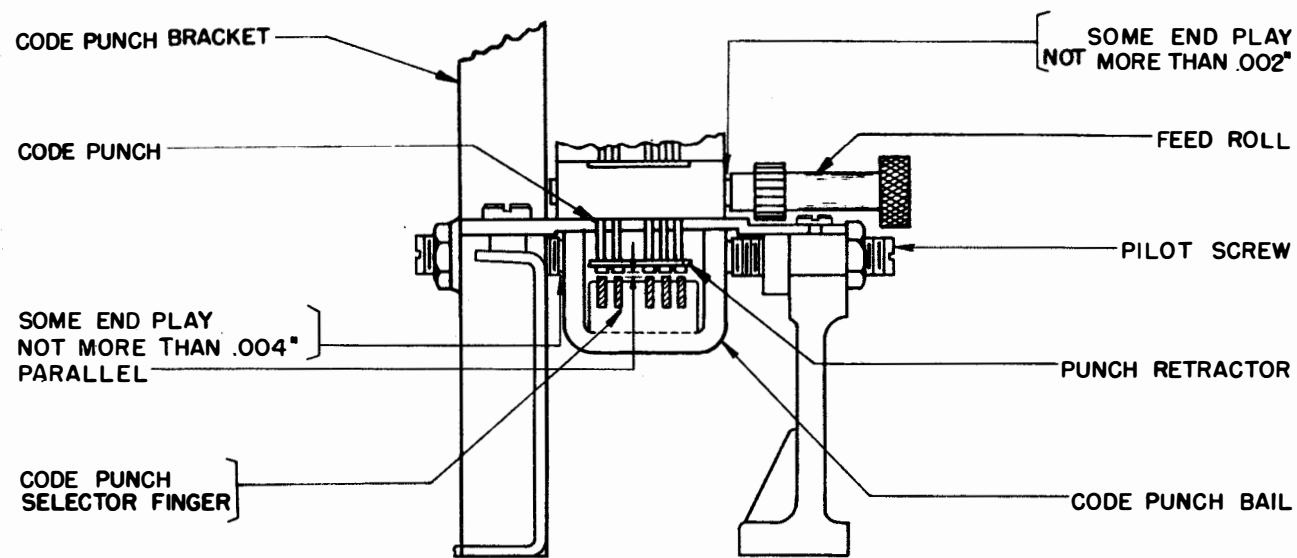


FIGURE 39

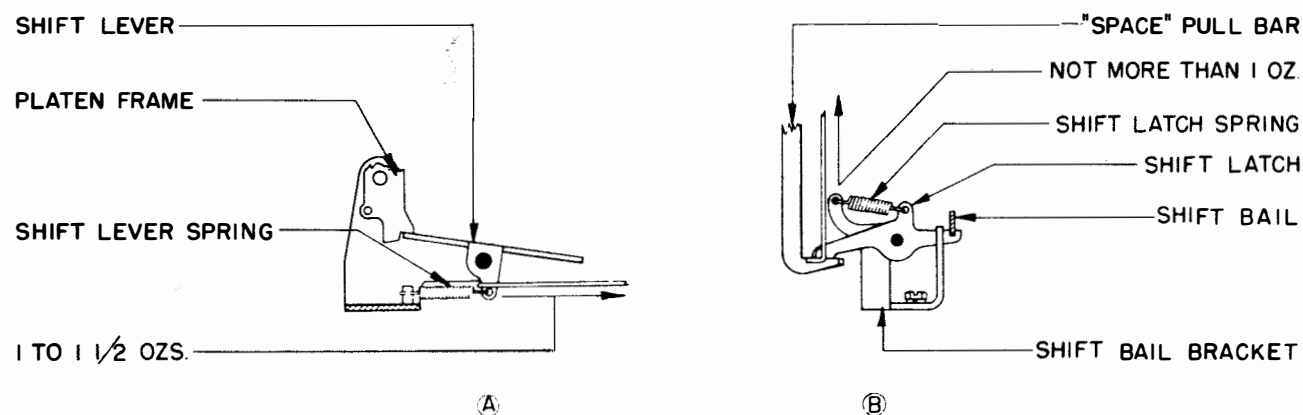


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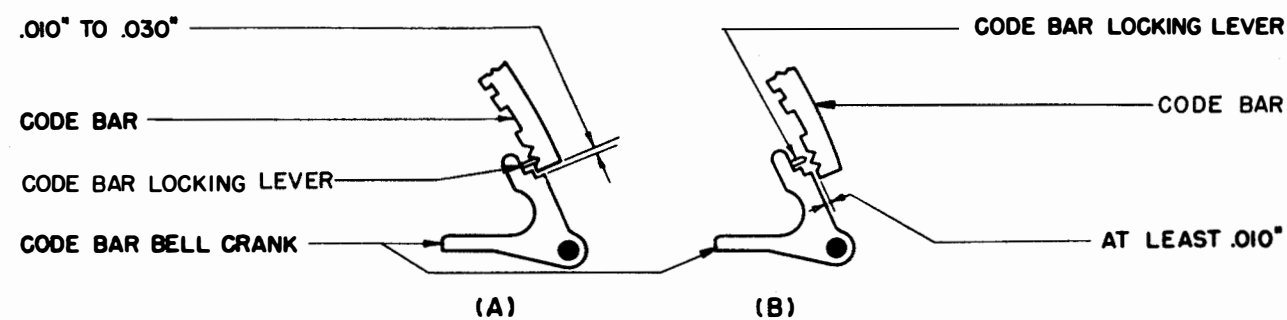


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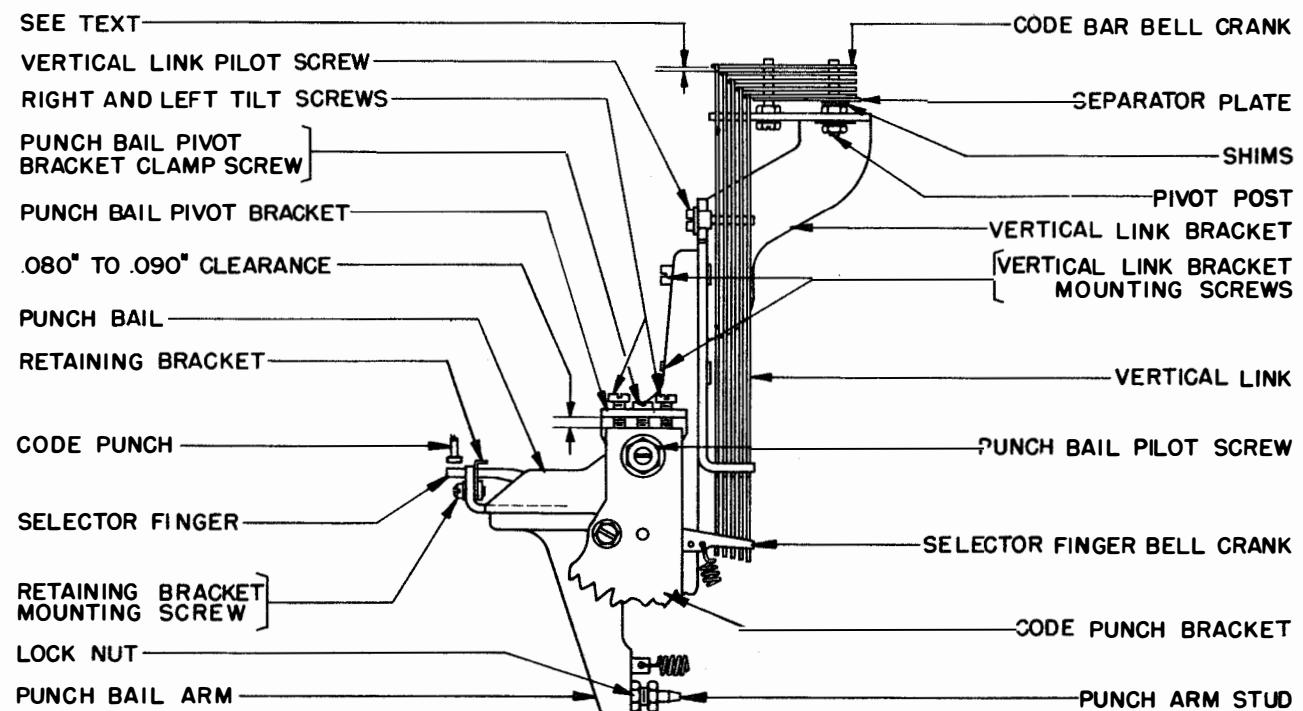


FIGURE 38

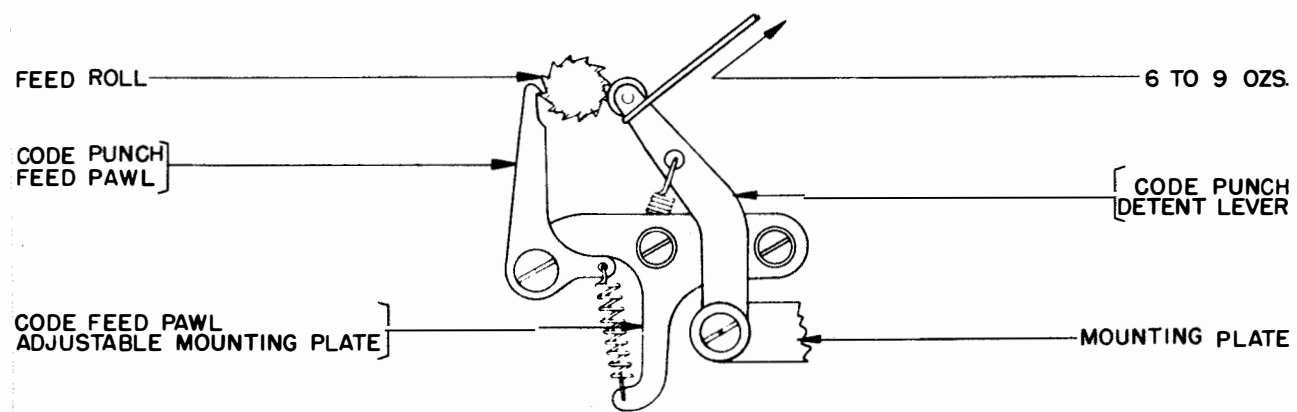


FIGURE 41

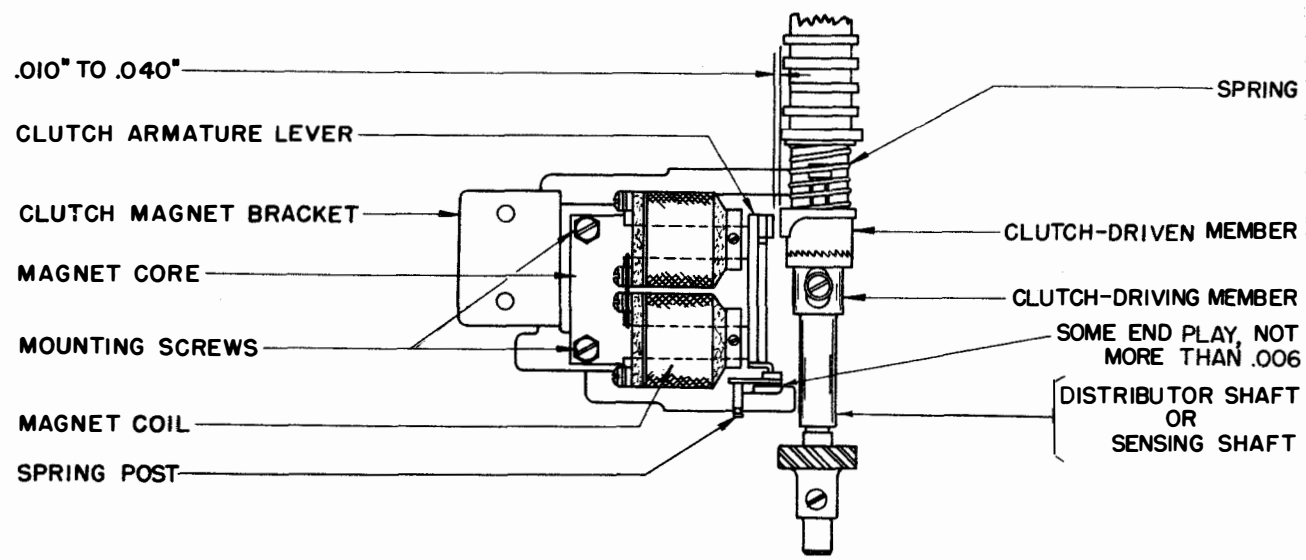


FIGURE 42

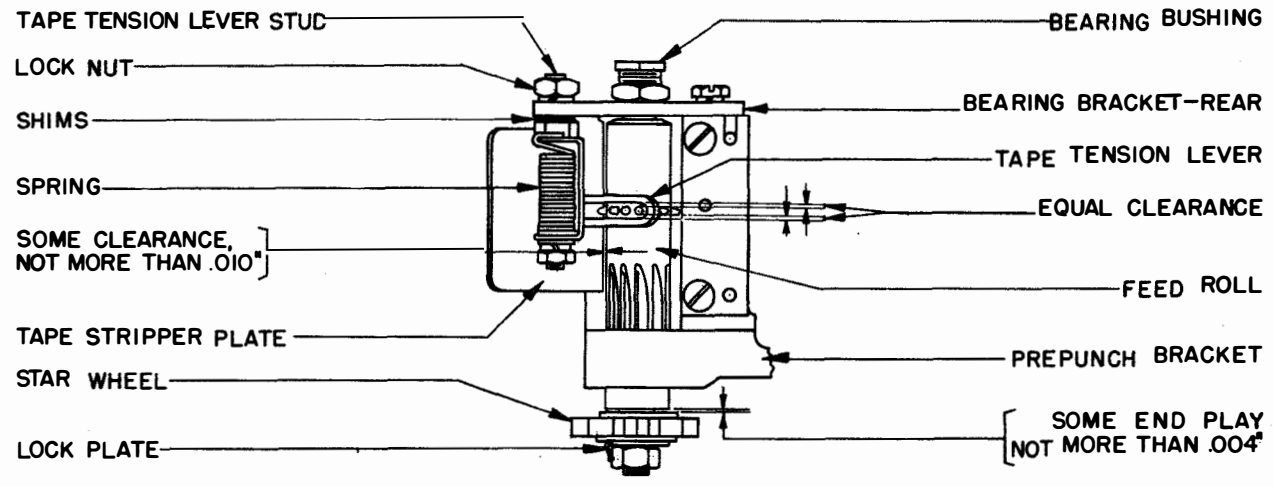


FIGURE 45

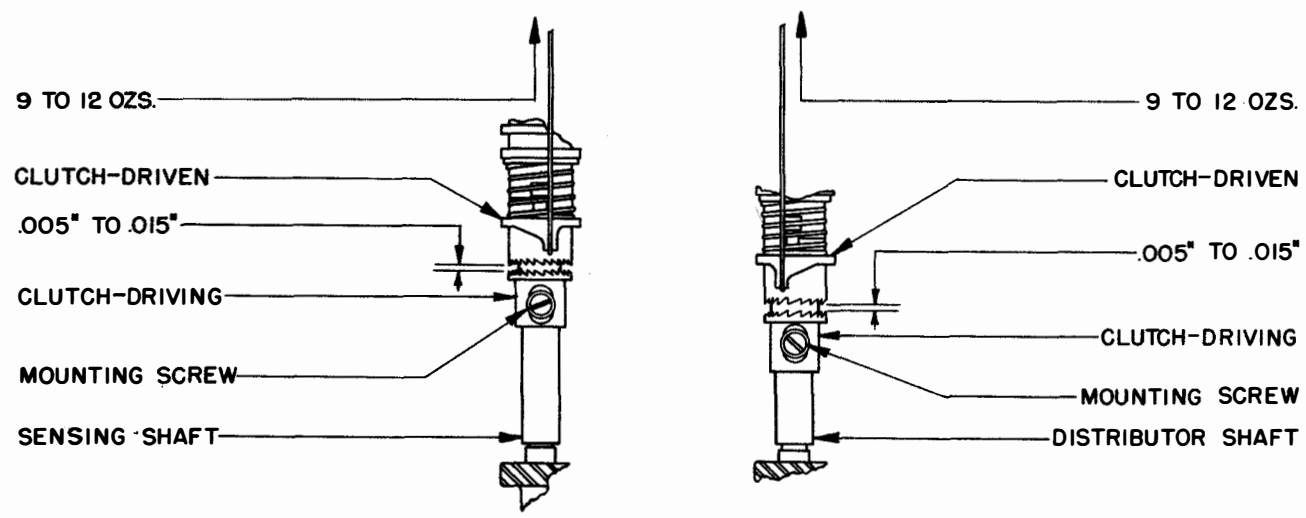


FIGURE 43

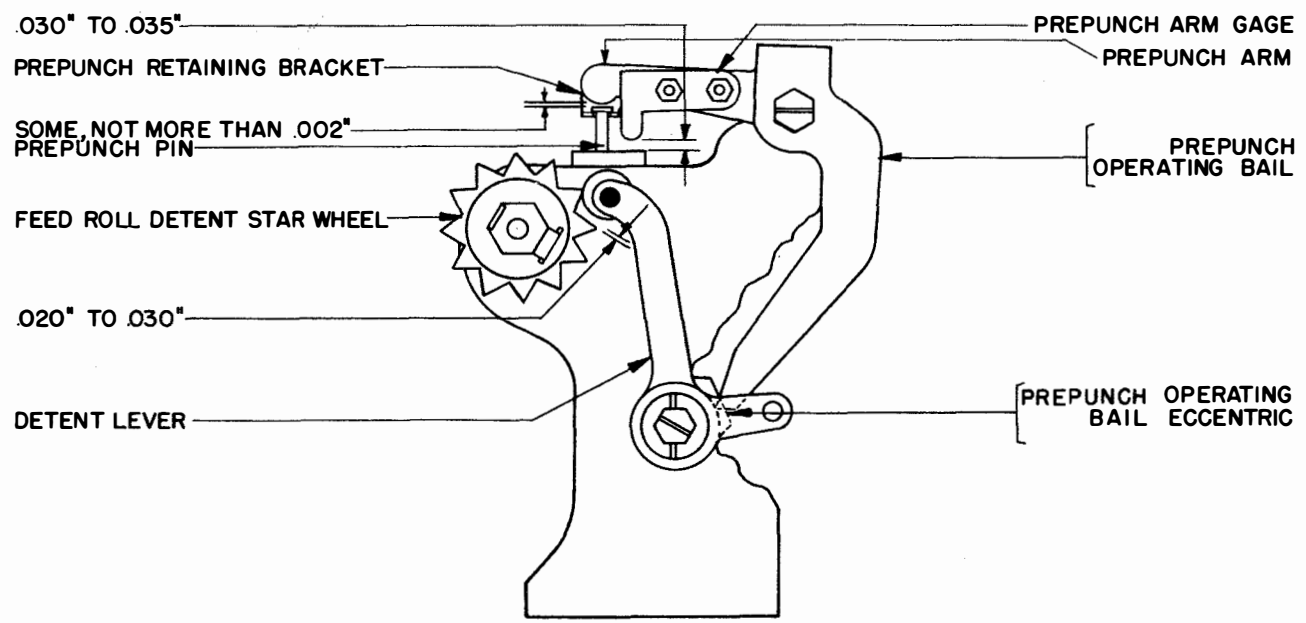


FIGURE 44

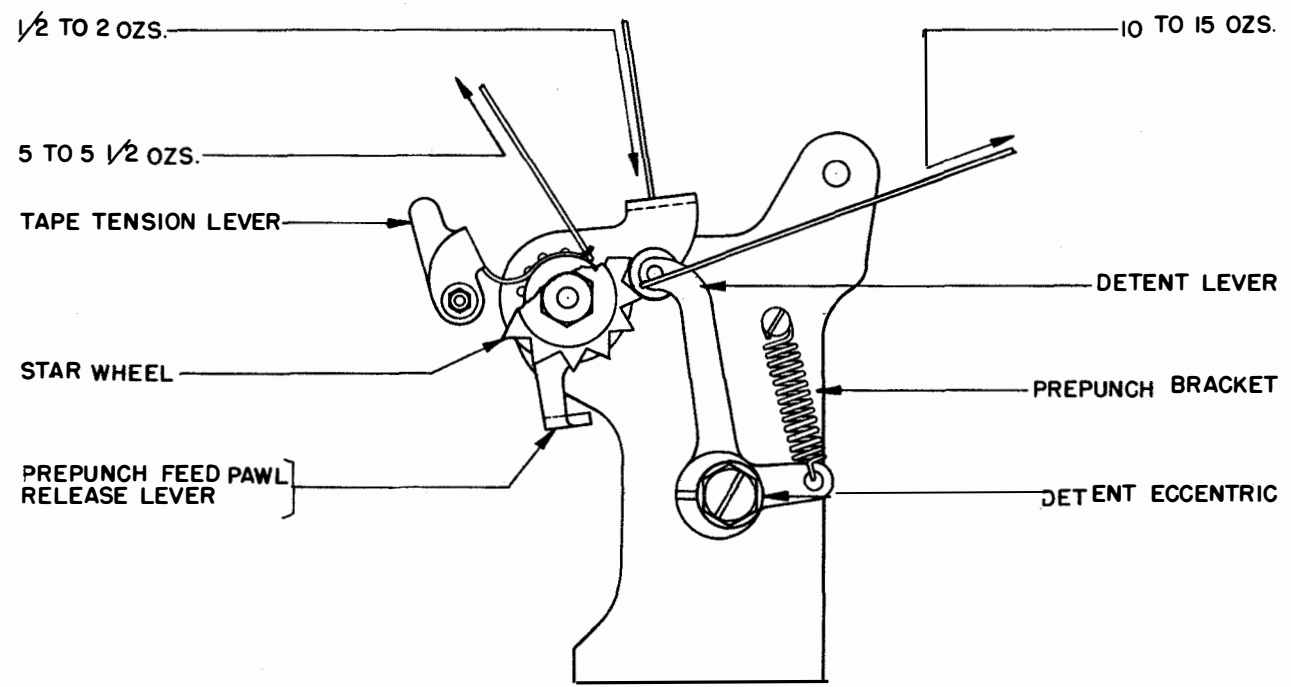


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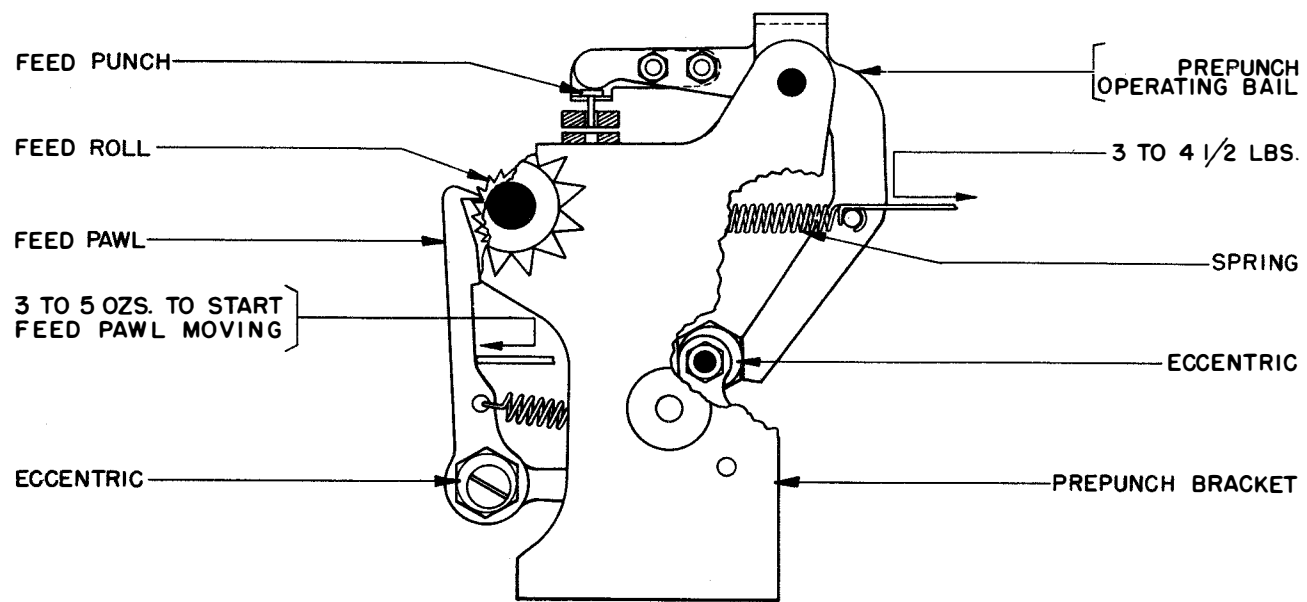


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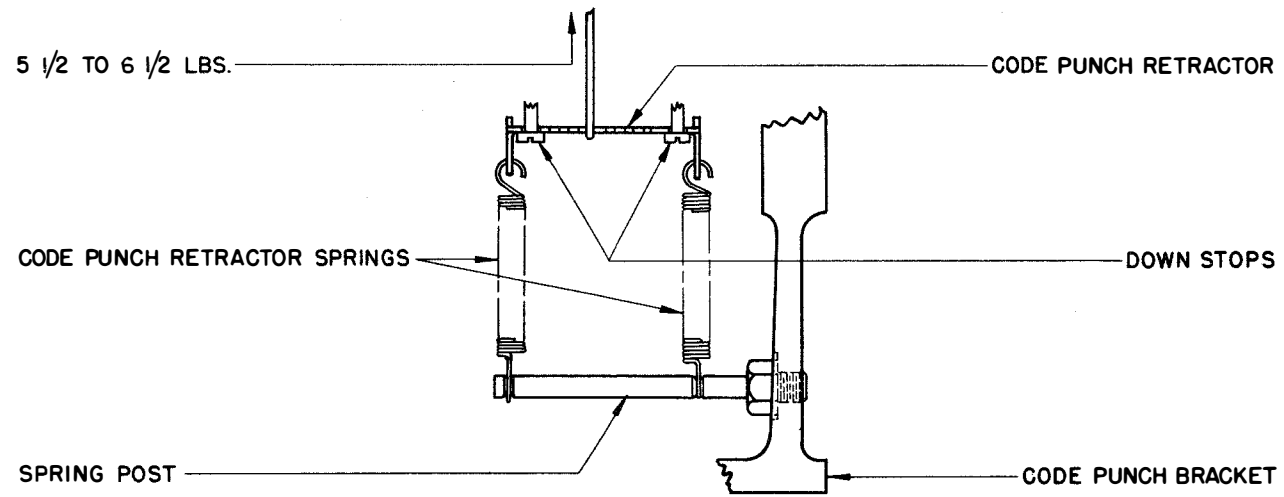


FIGURE 50

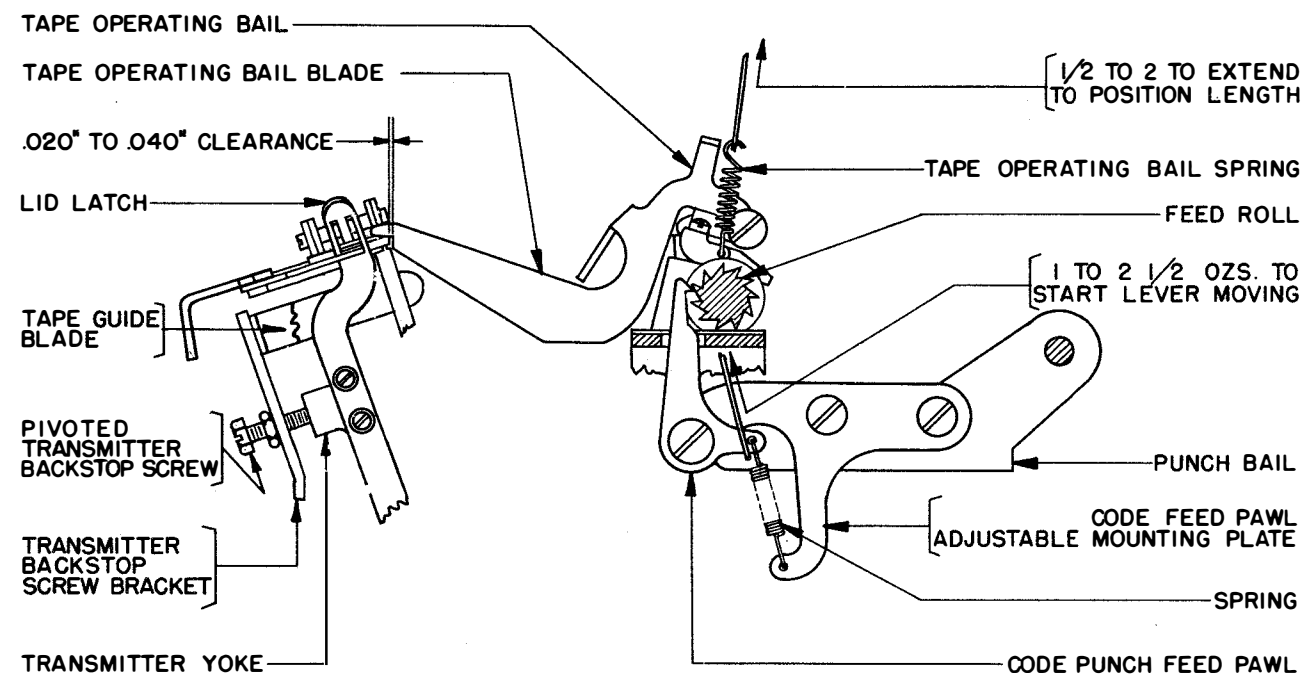


FIGURE 48

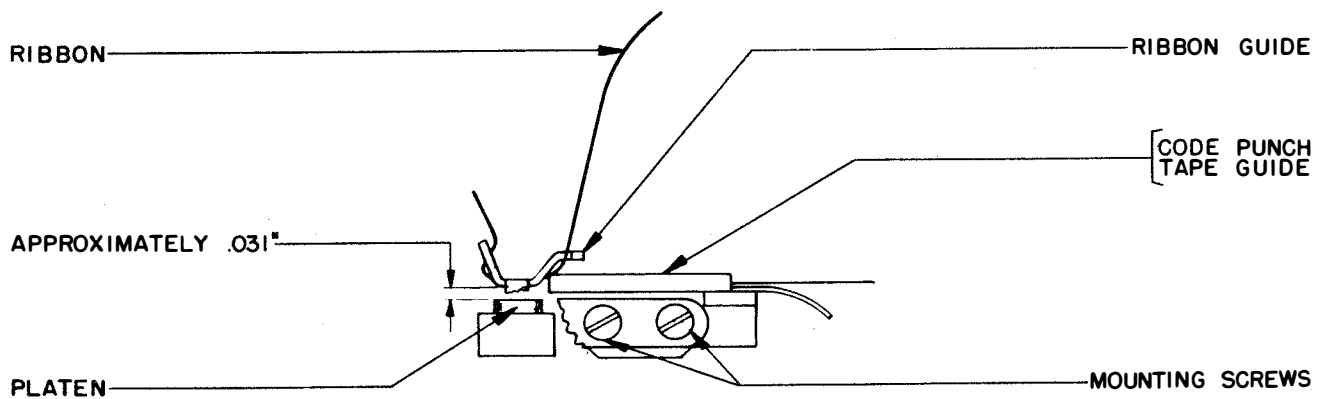


FIGURE 49

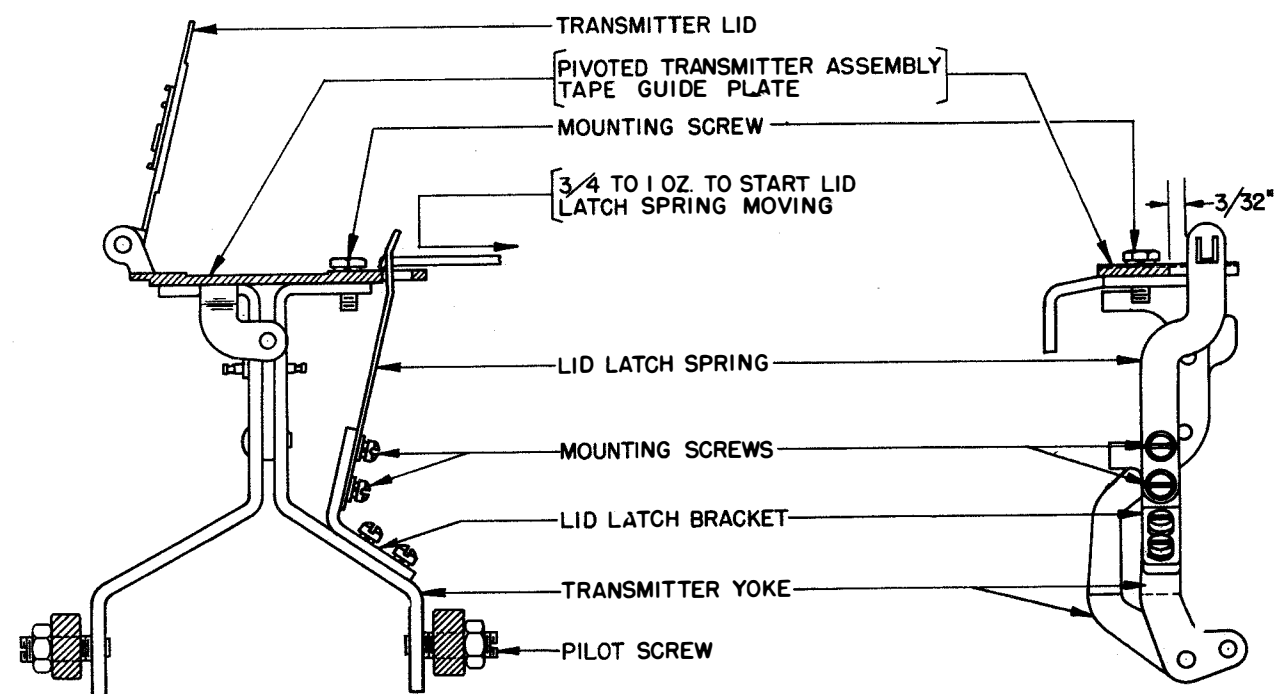
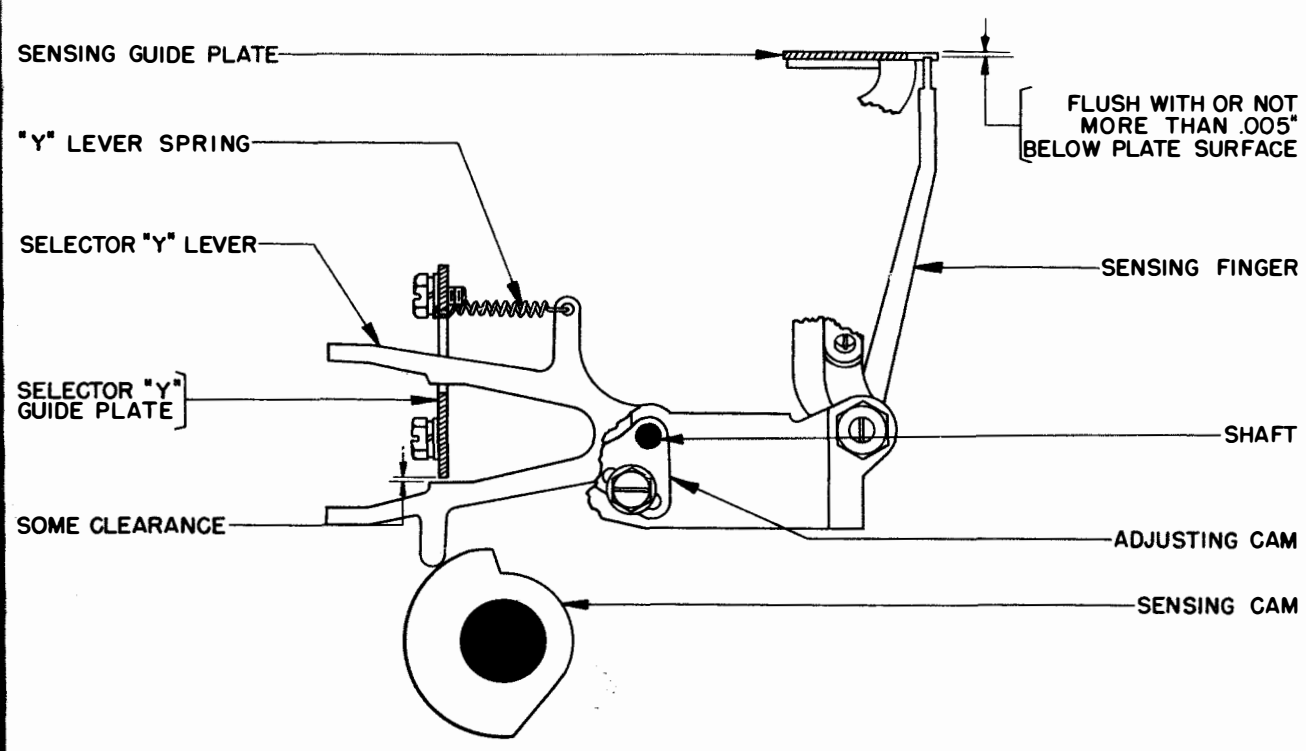
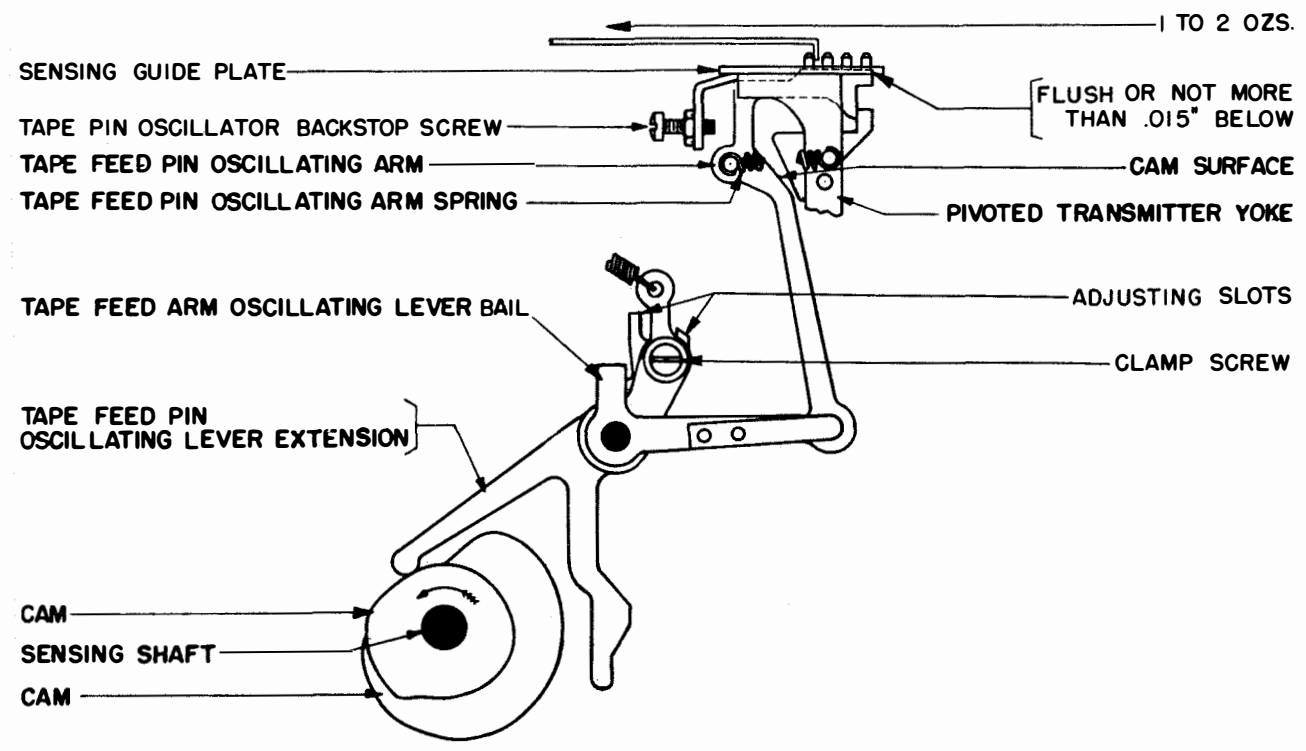


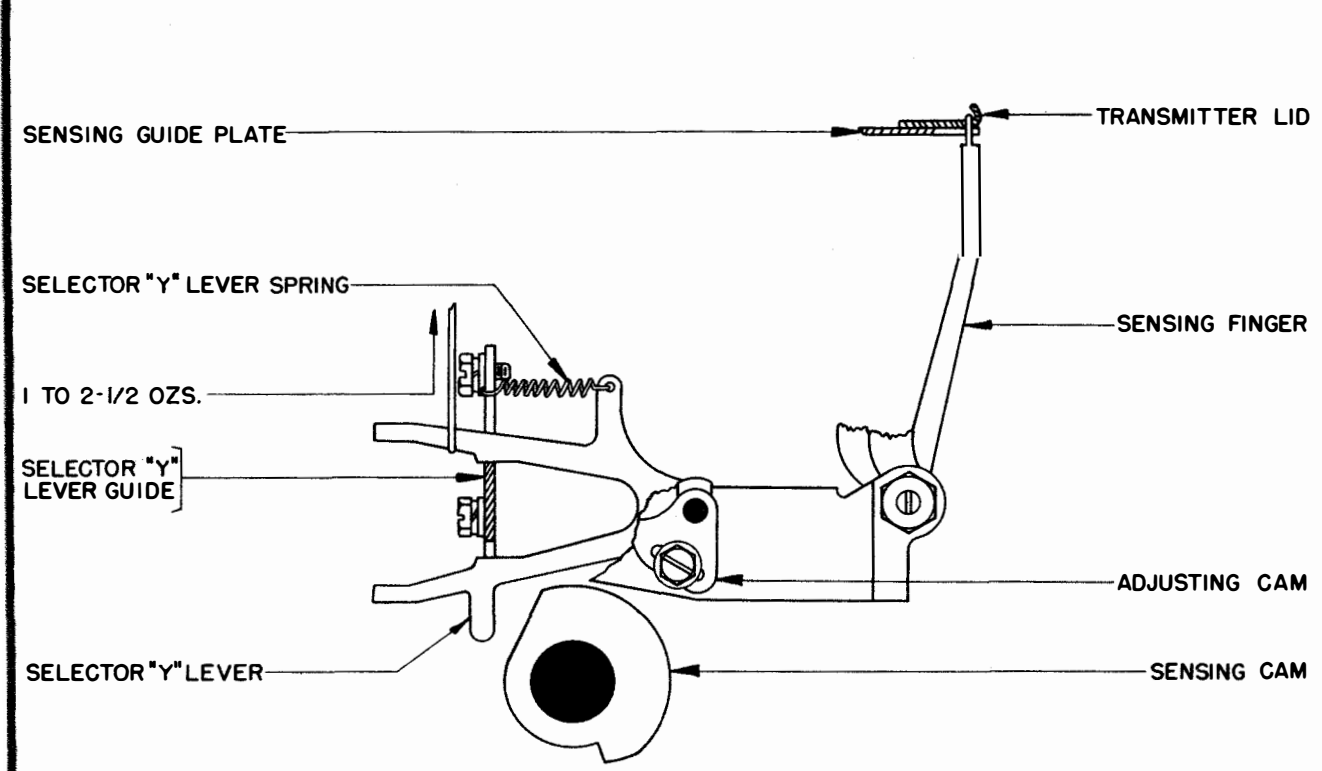
FIGURE 51



FRONT VIEW
FIGURE 52



FRONT VIEW
FIGURE 54



FRONT VIEW
FIGURE 53

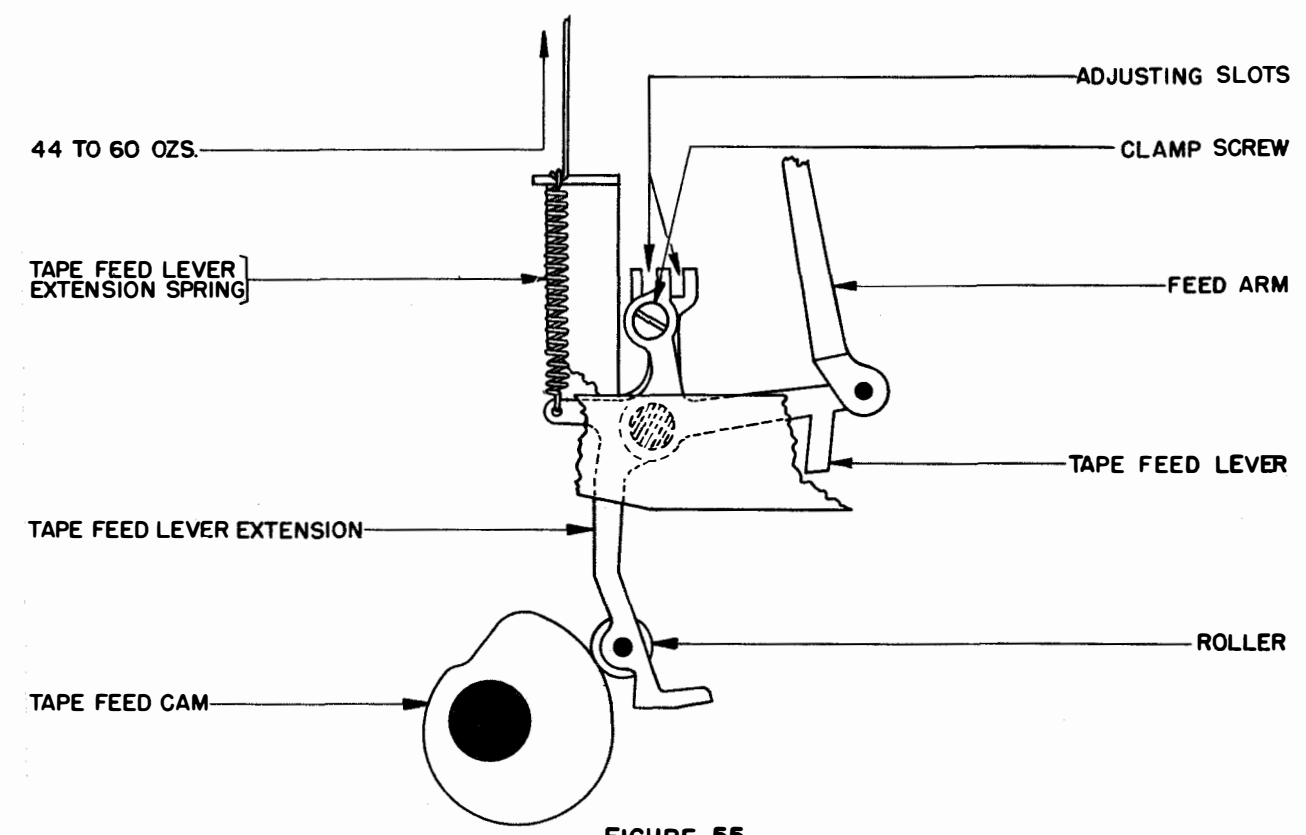


FIGURE 55

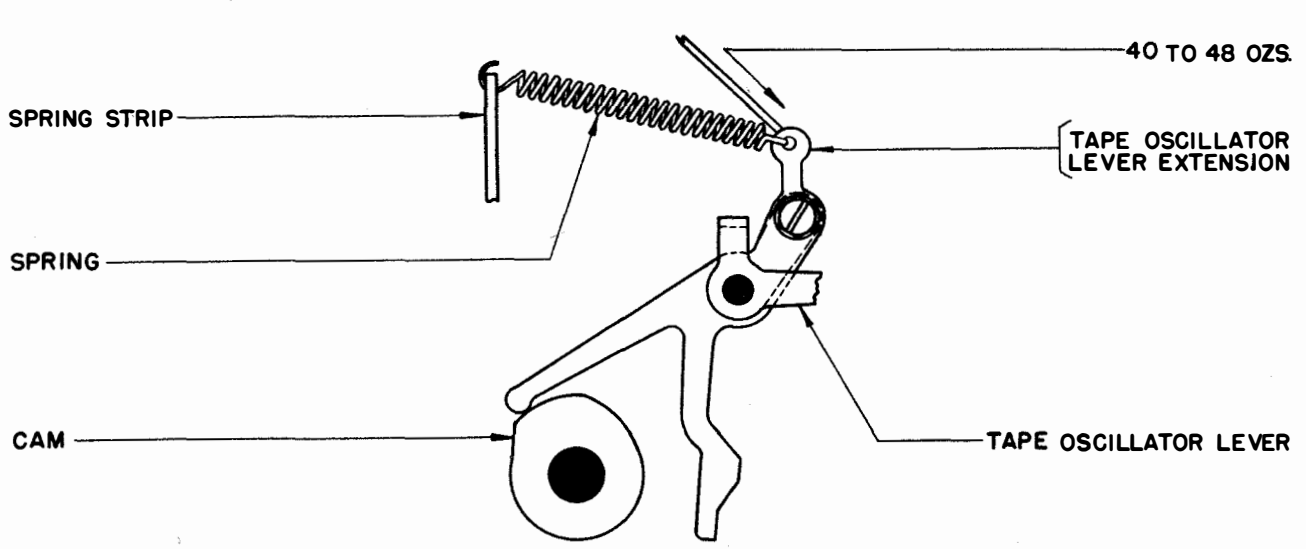


FIGURE 56

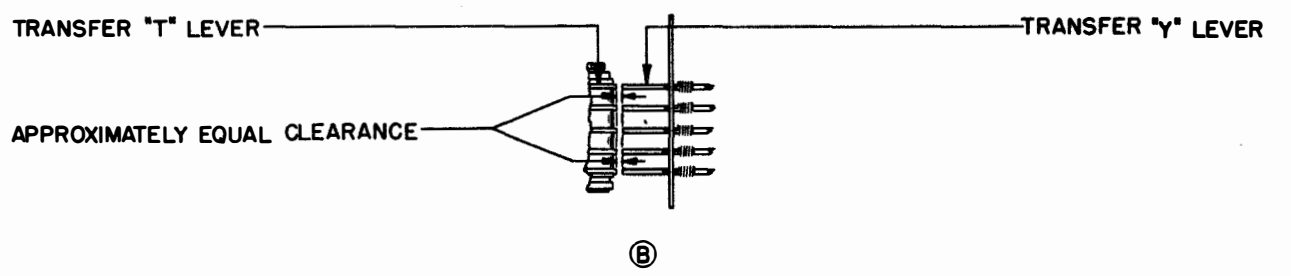
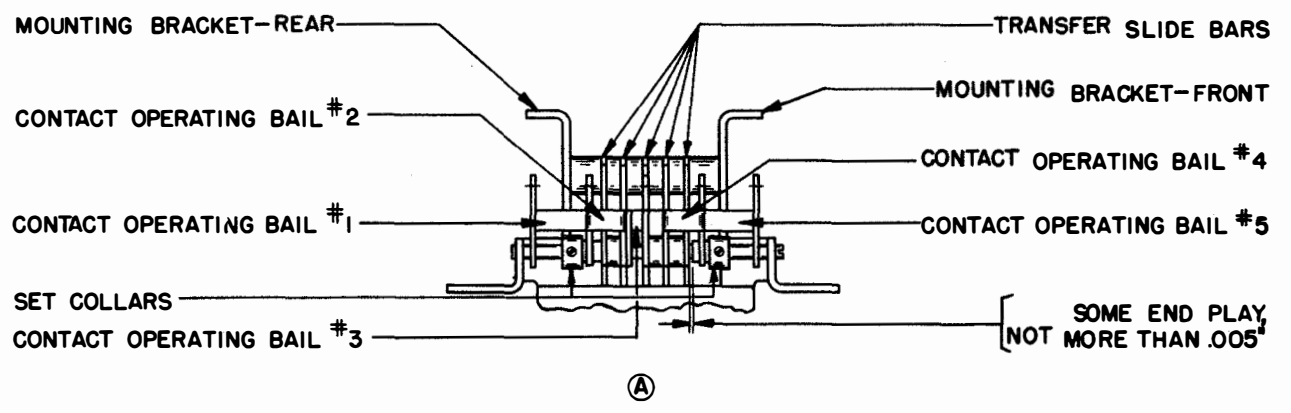


FIGURE 58

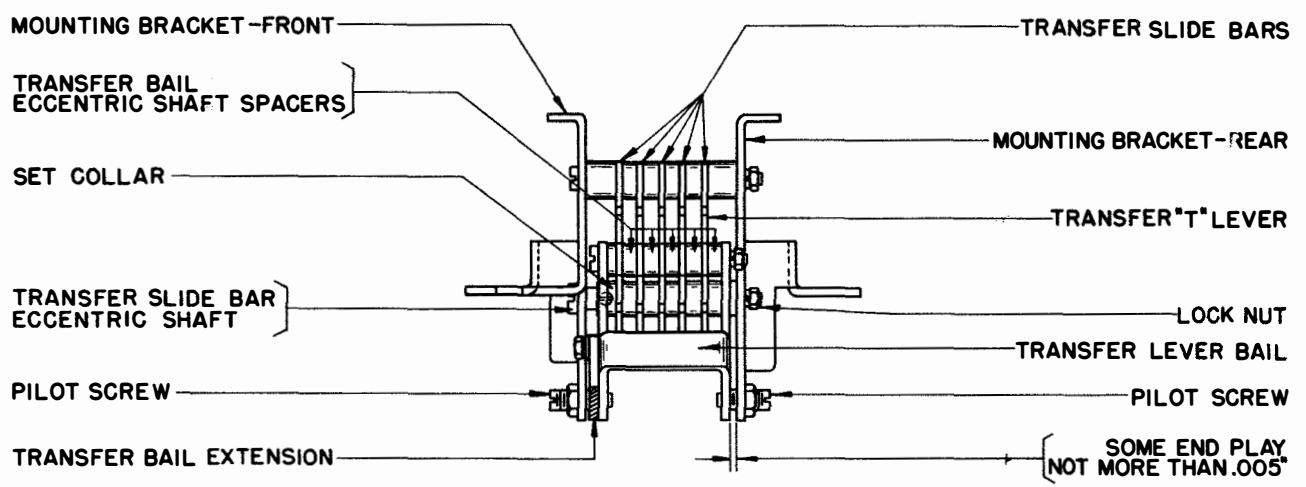


FIGURE 57

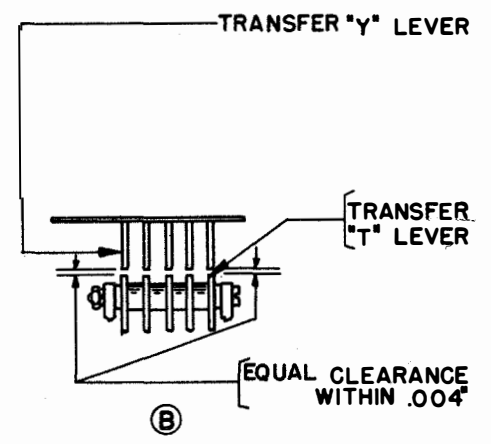
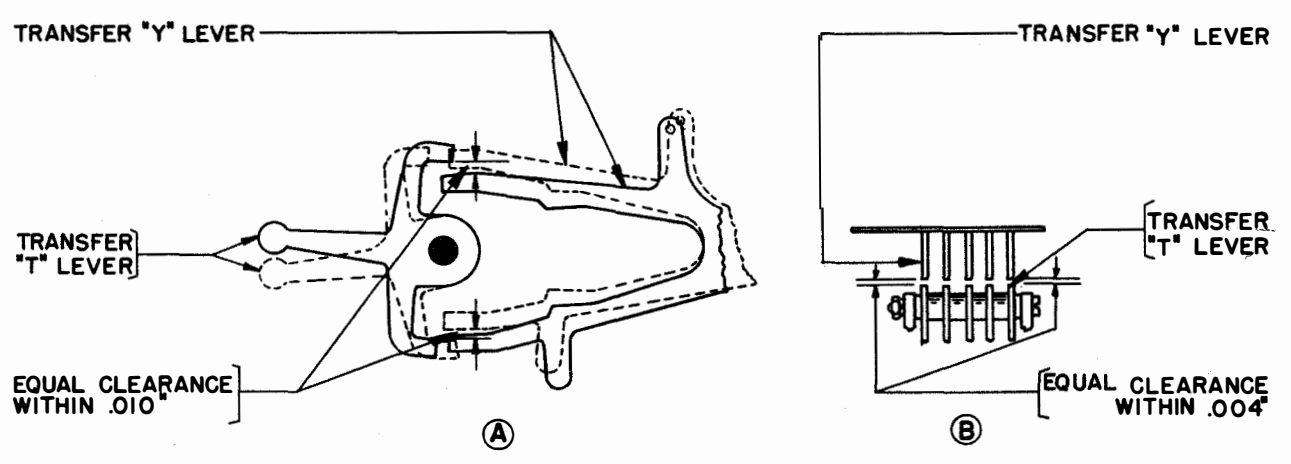


FIGURE 59

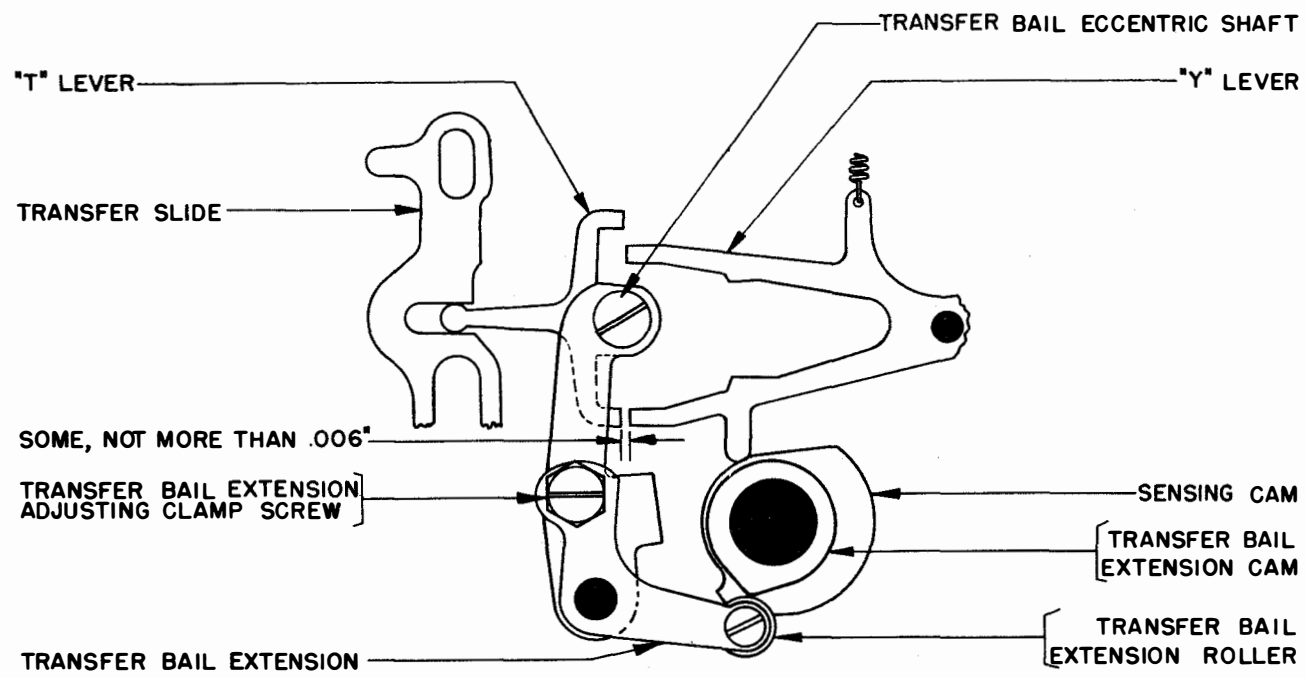


FIGURE 60

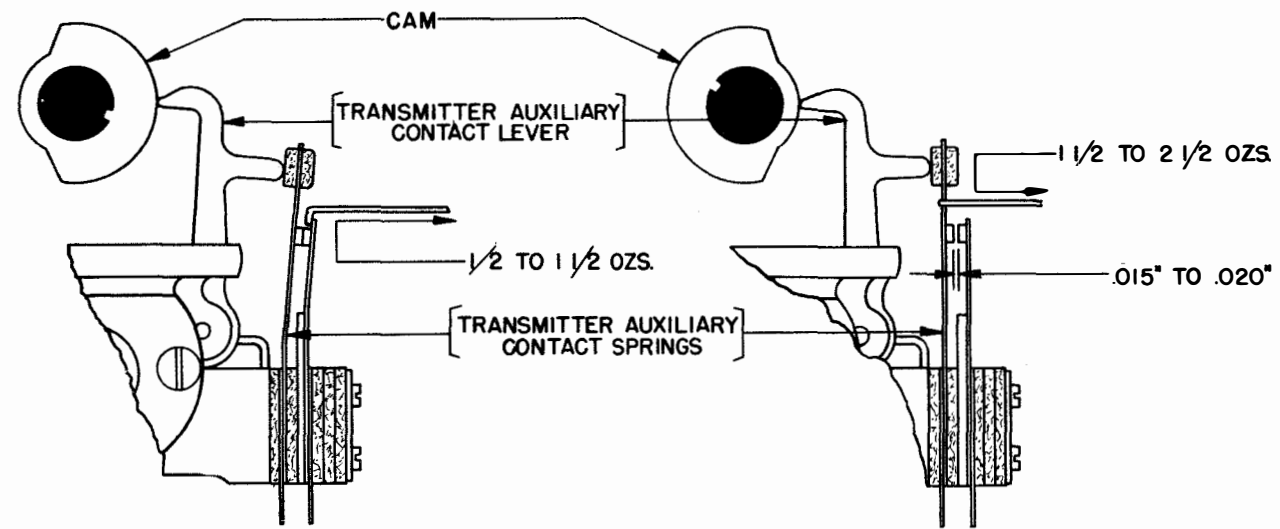


FIGURE 62

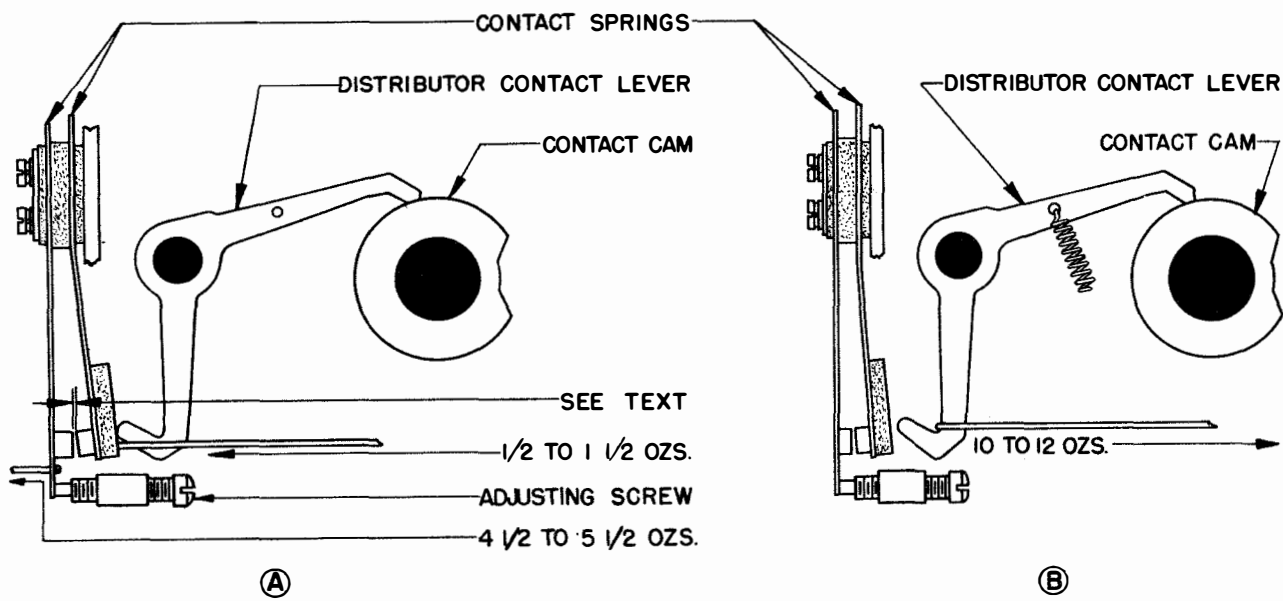


FIGURE 61

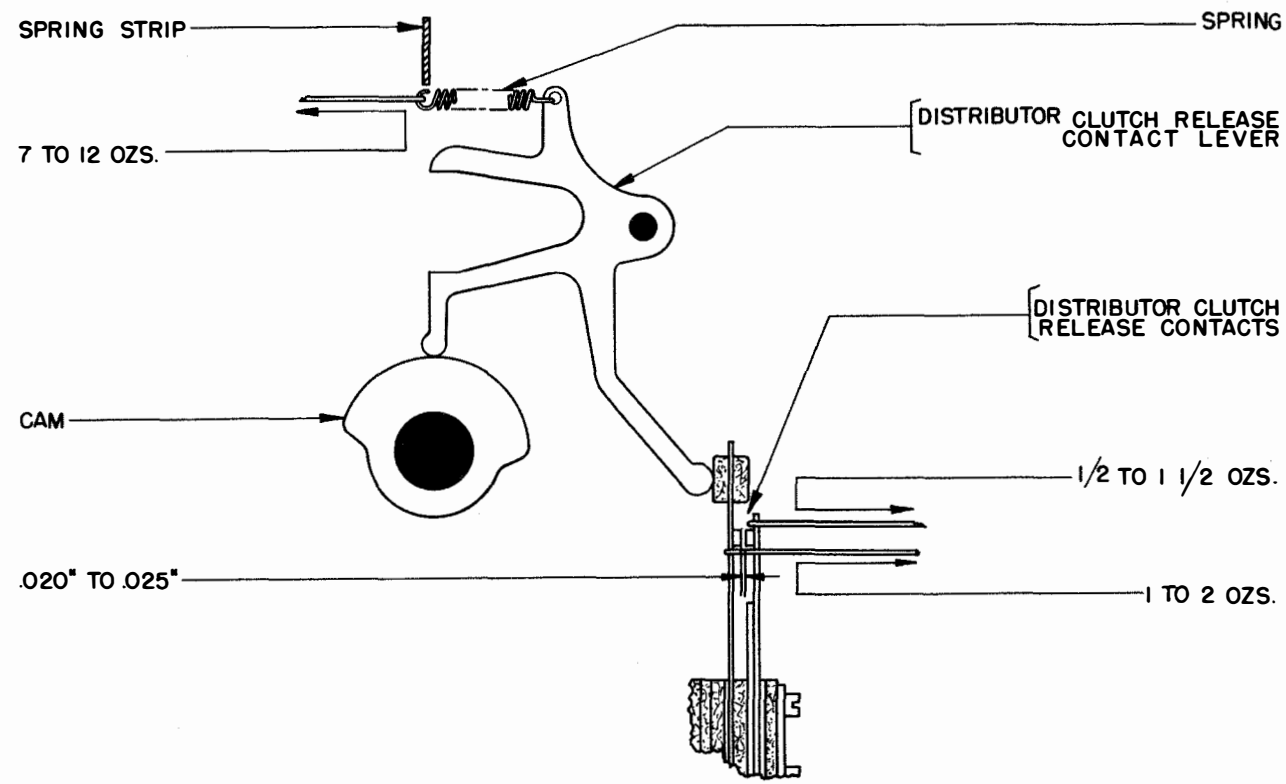


FIGURE 63

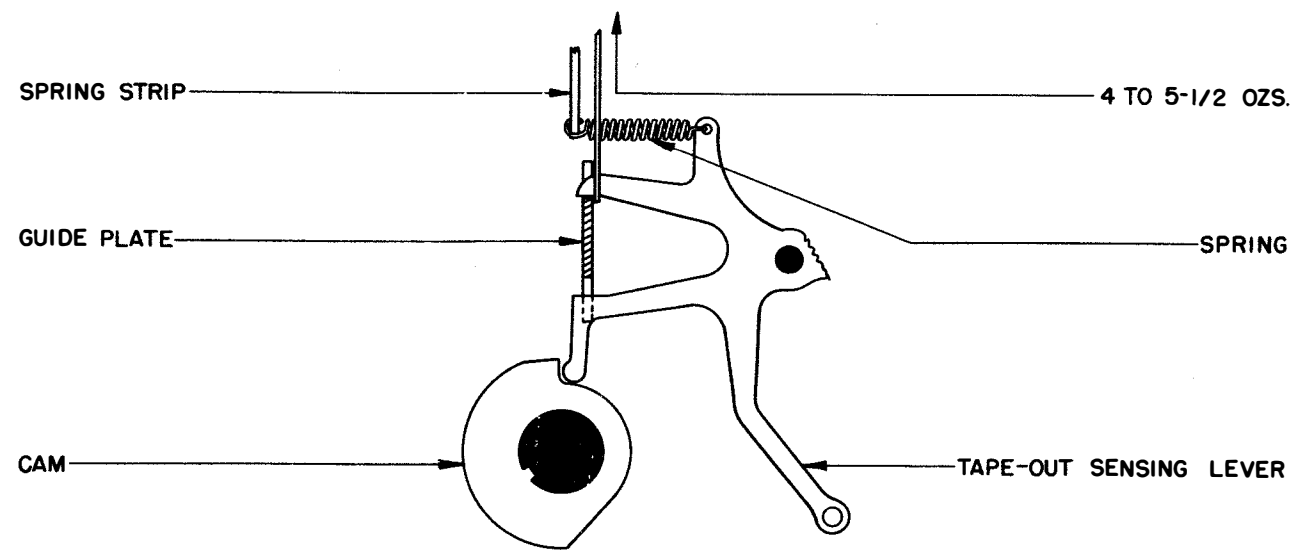


FIGURE 64

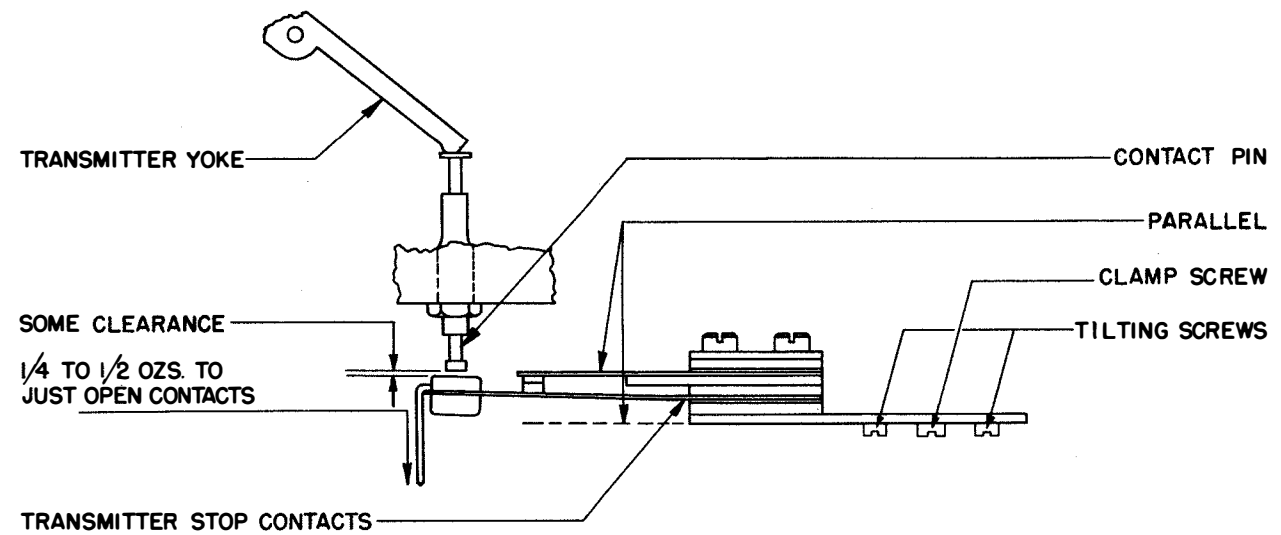


FIGURE 67

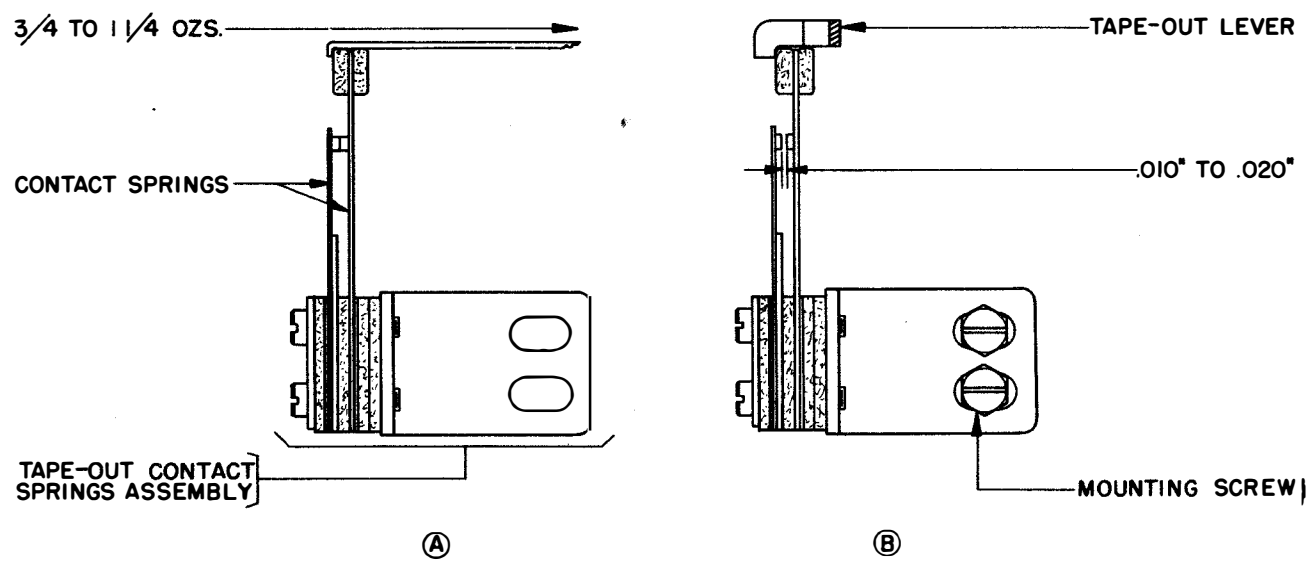
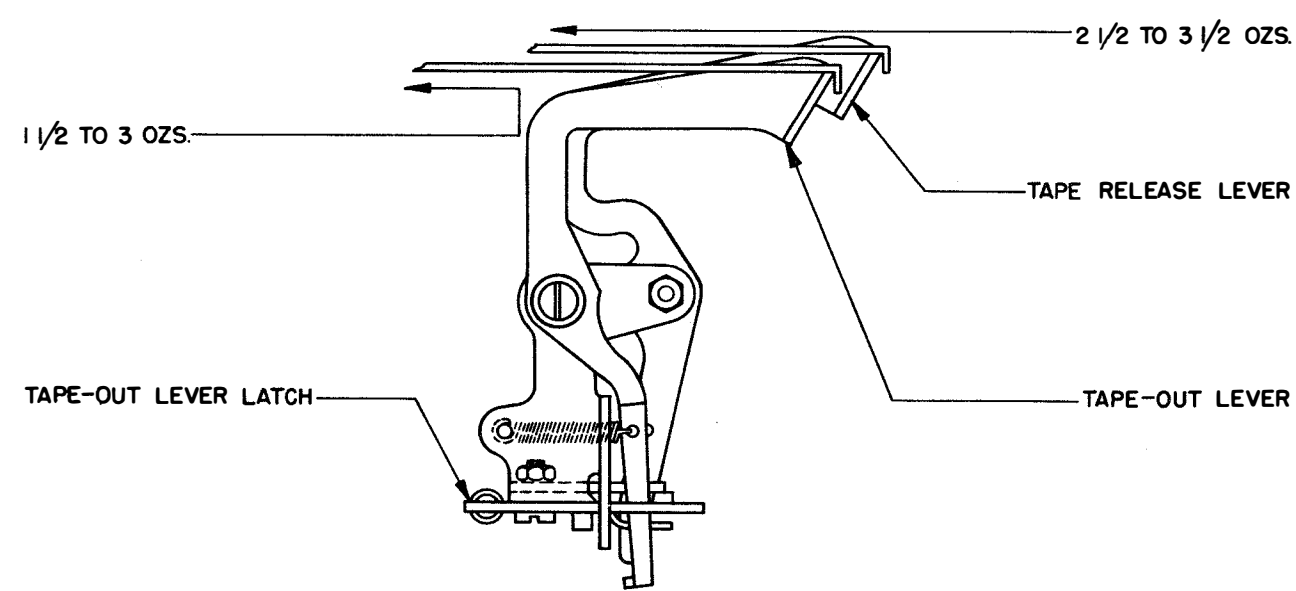


FIGURE 65



RIGHT SIDE VIEW
FIGURE 66

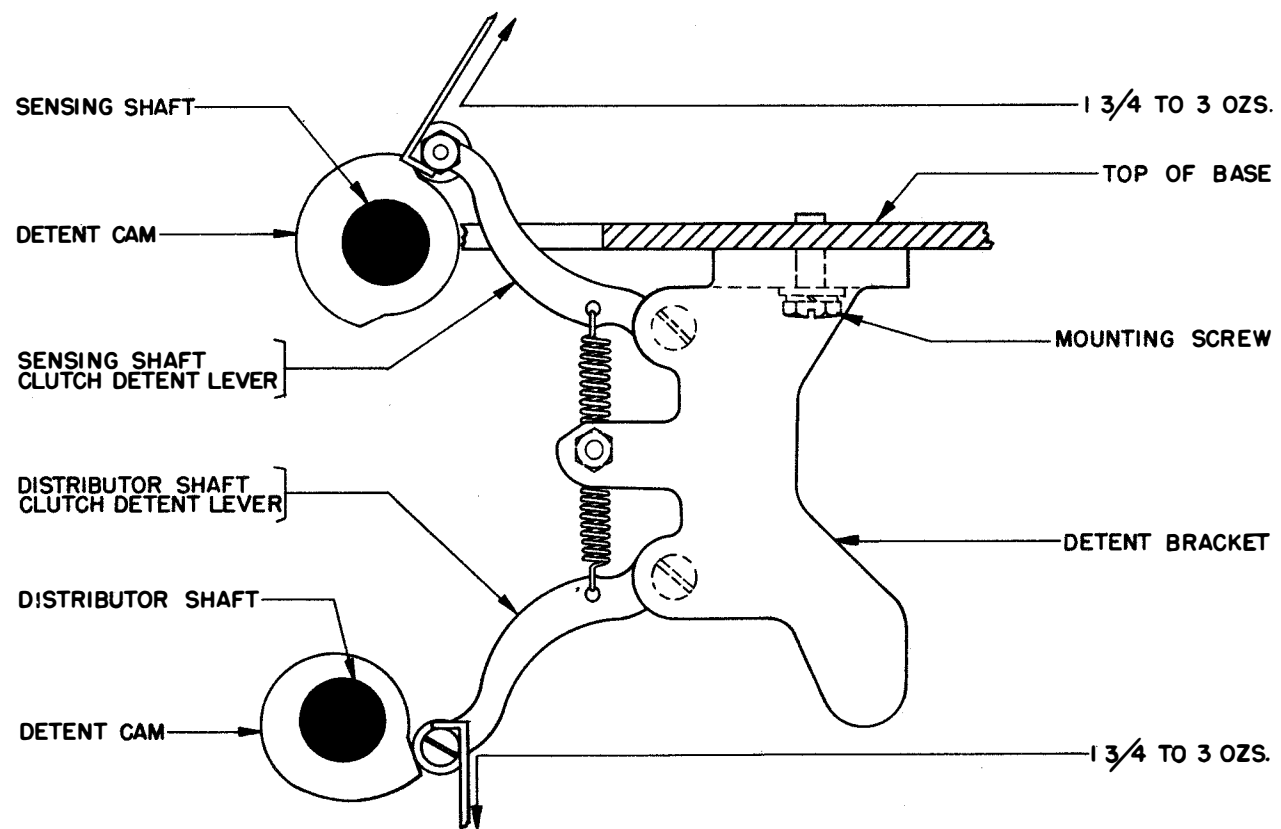


FIGURE 68

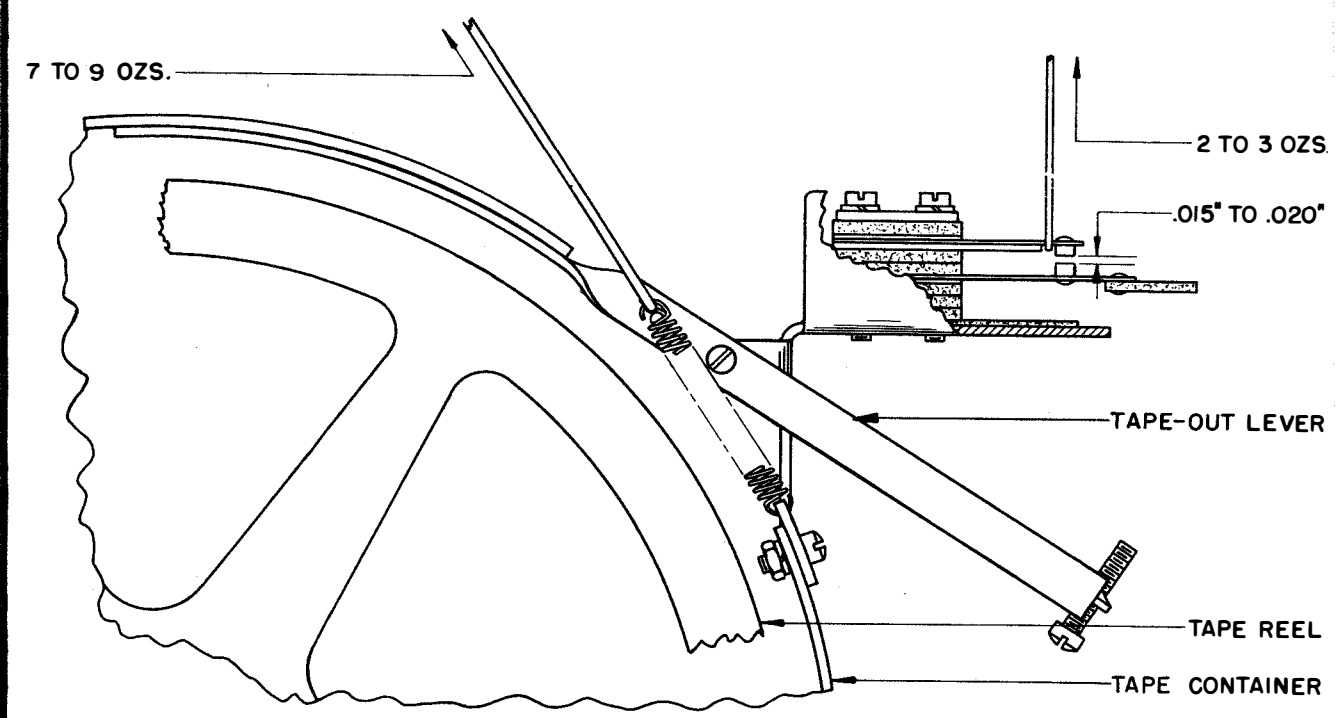


FIGURE 69

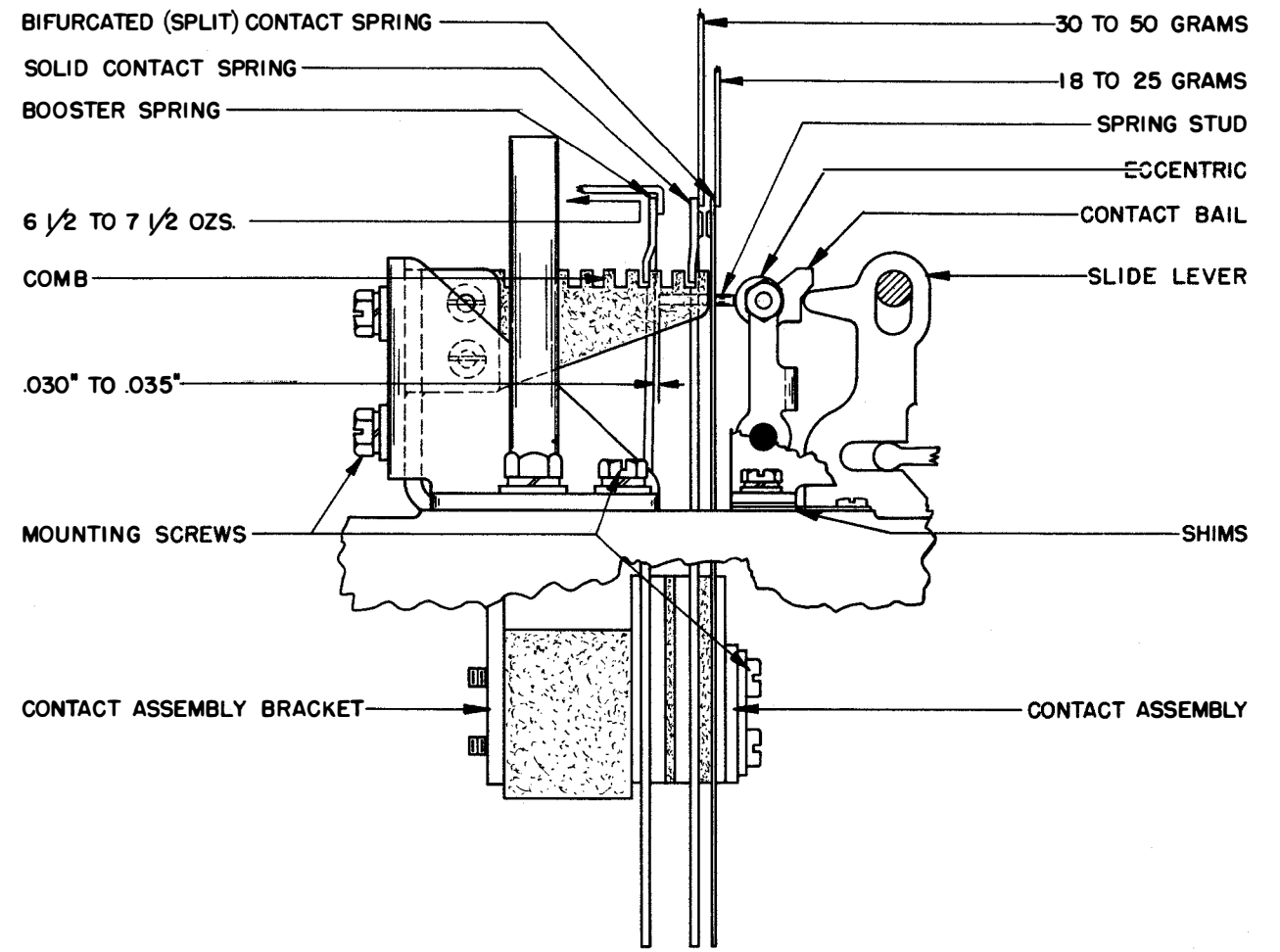


FIGURE 72

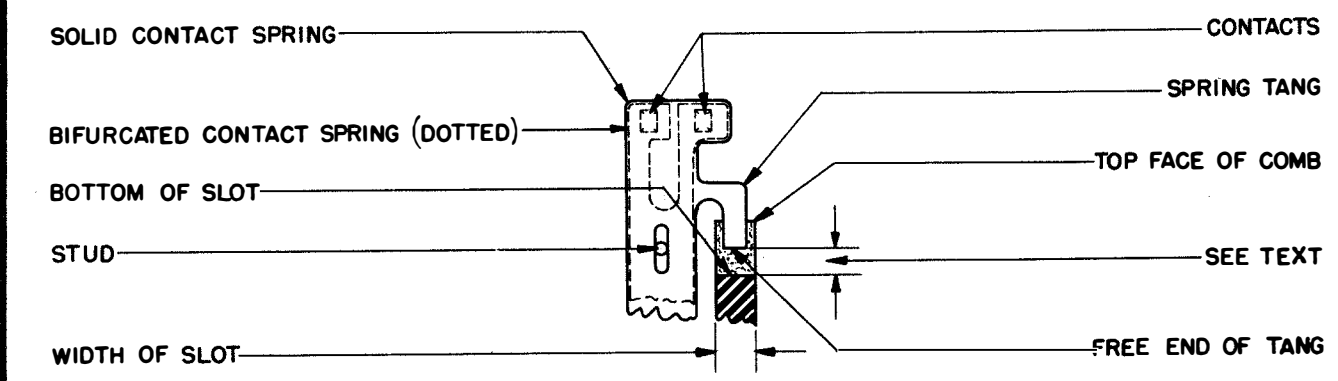


FIGURE 70

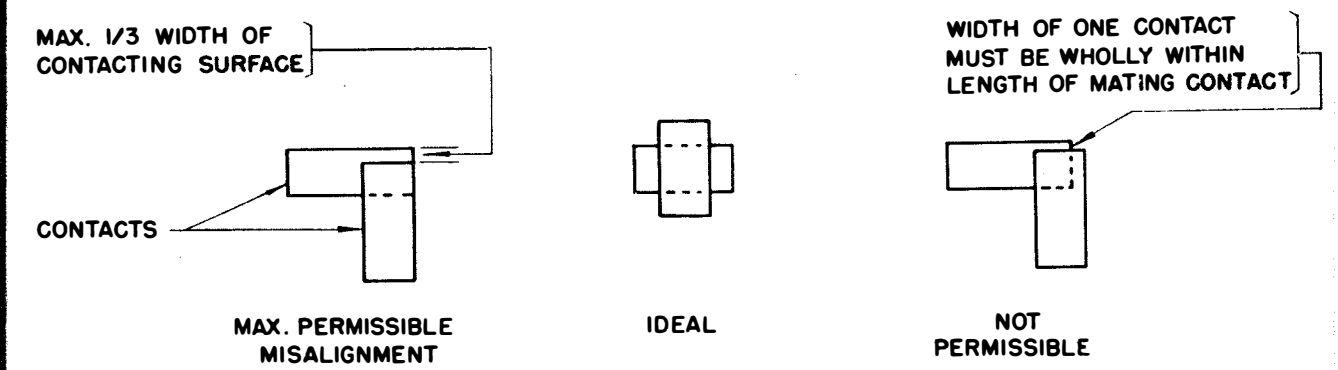


FIGURE 71

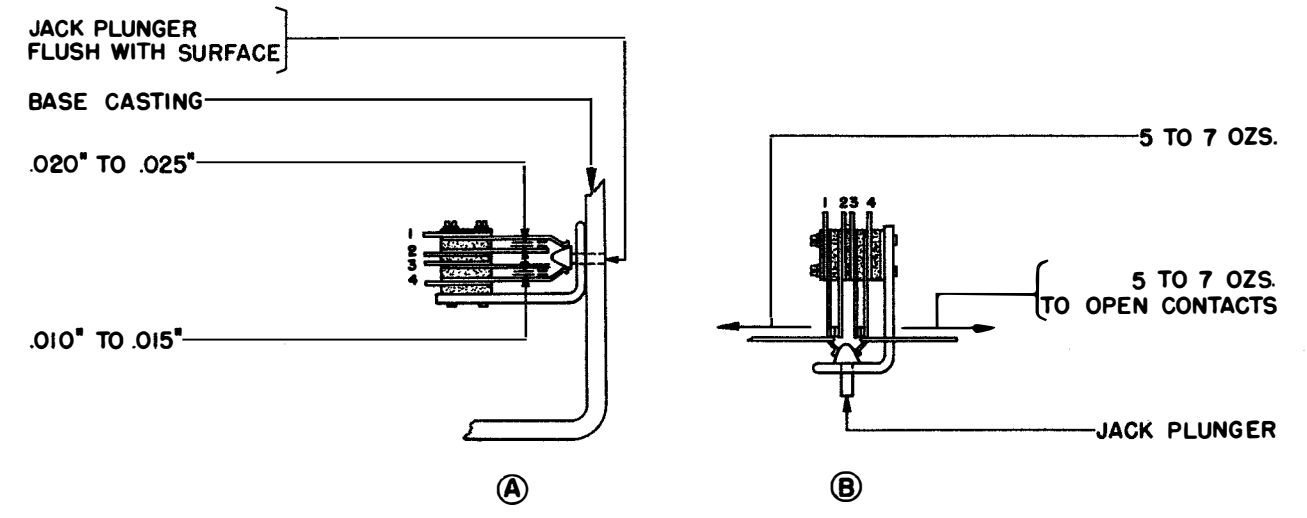


FIGURE 73

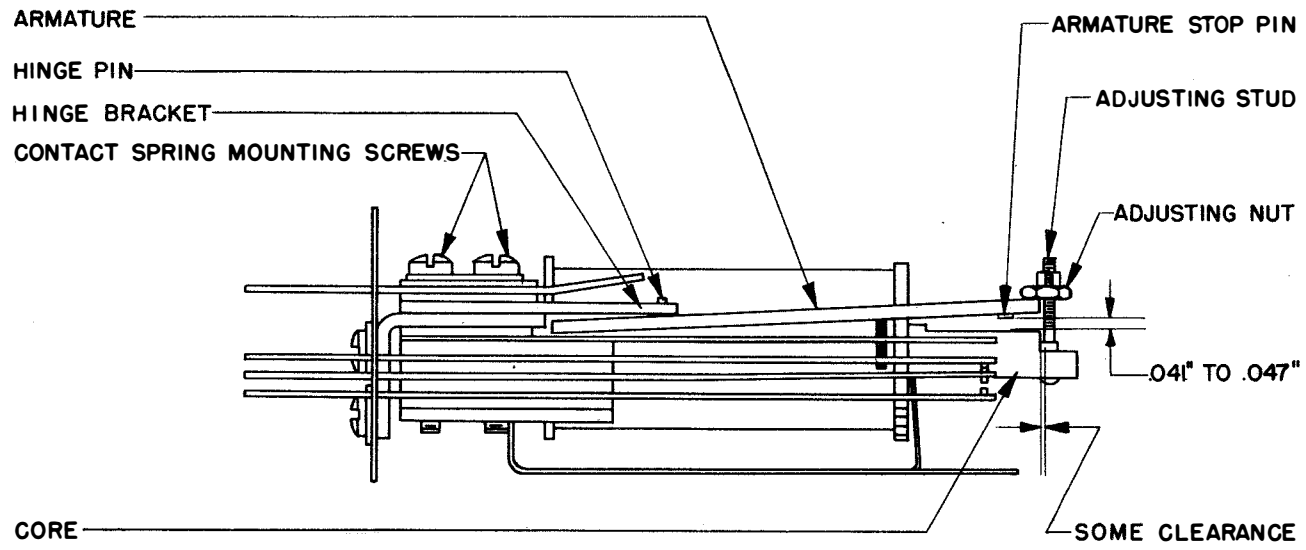


FIGURE 74

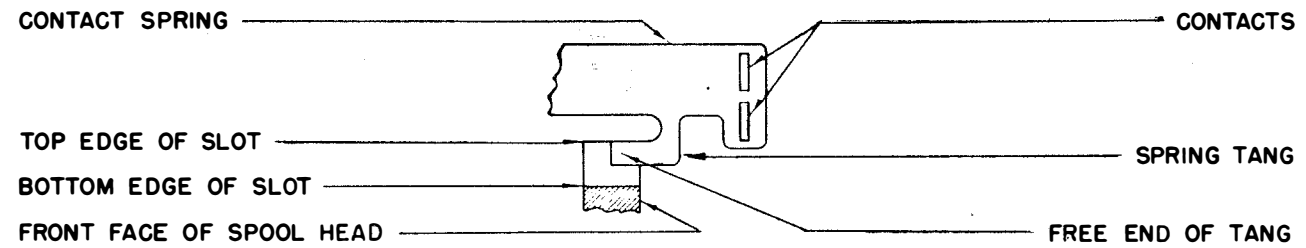


FIGURE 75

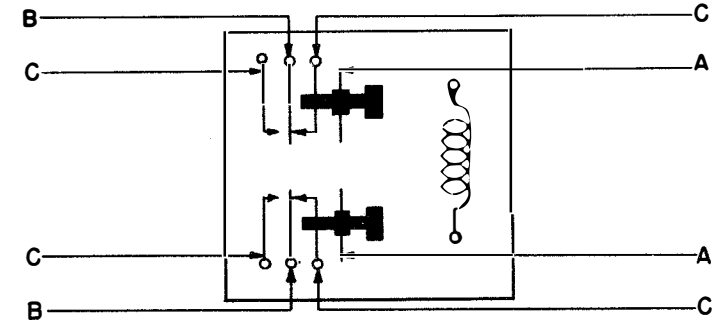


FIGURE 76

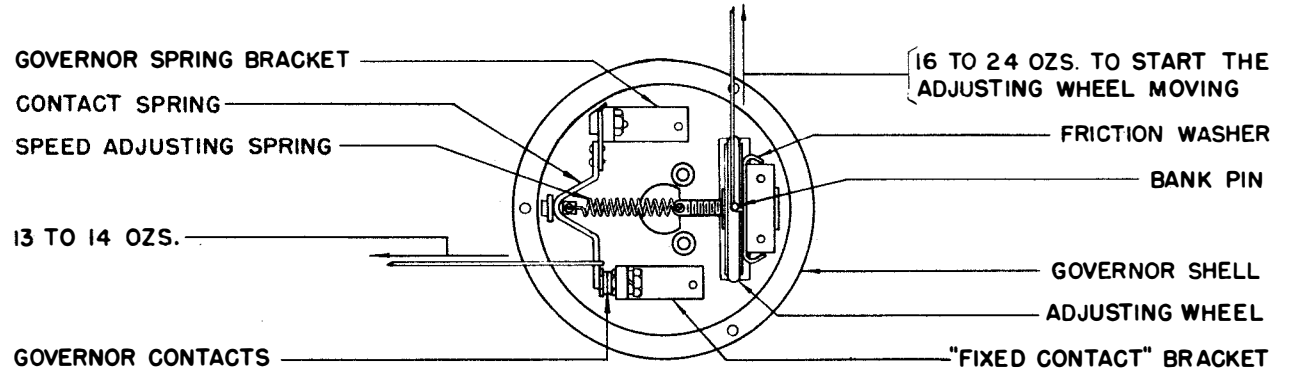


FIGURE 77

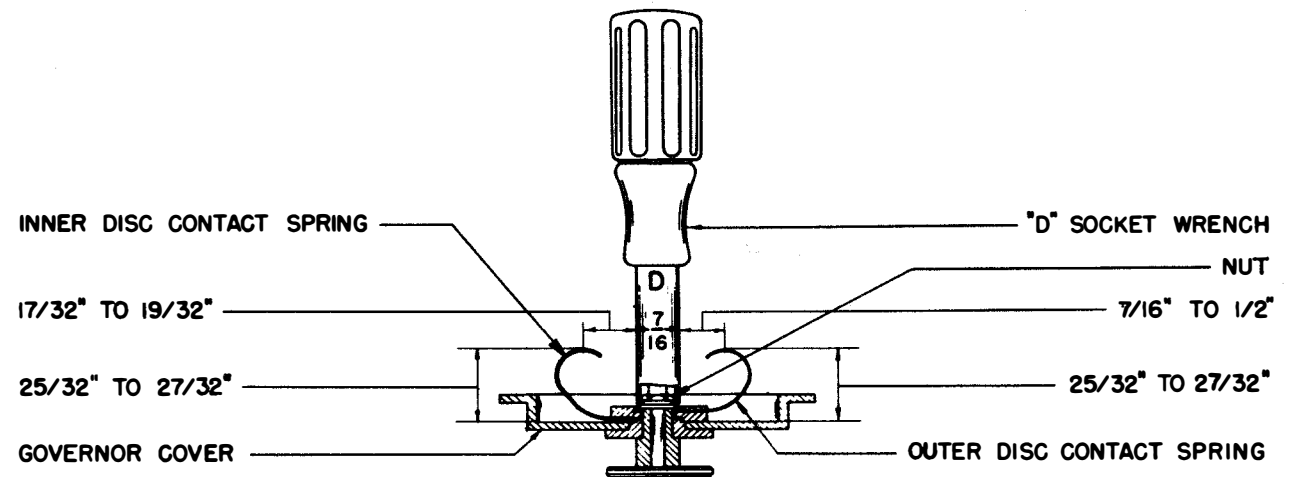


FIGURE 78

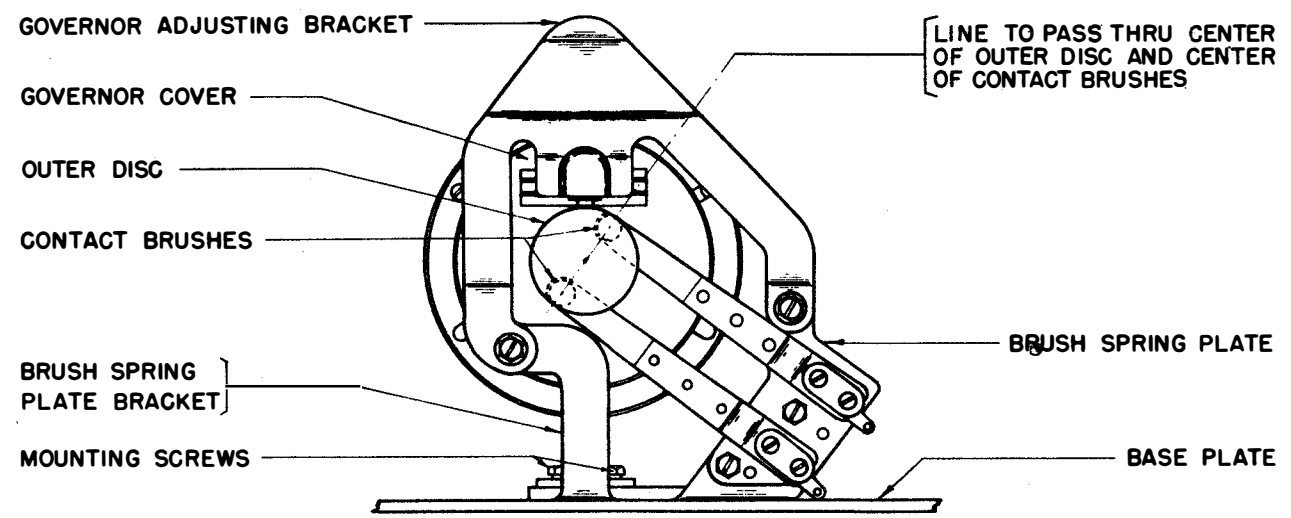


FIGURE 79

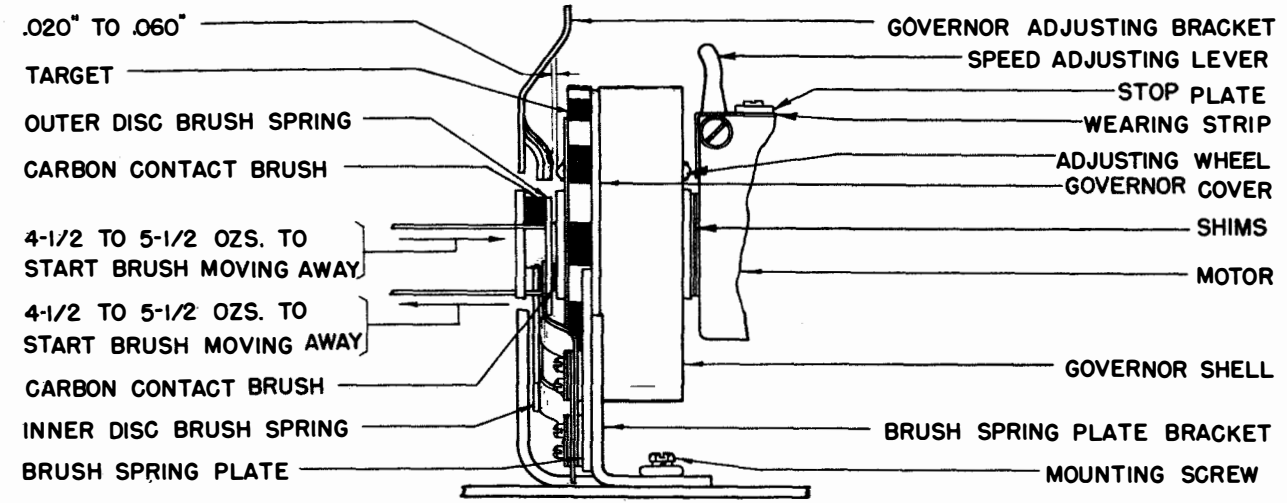


FIGURE 80

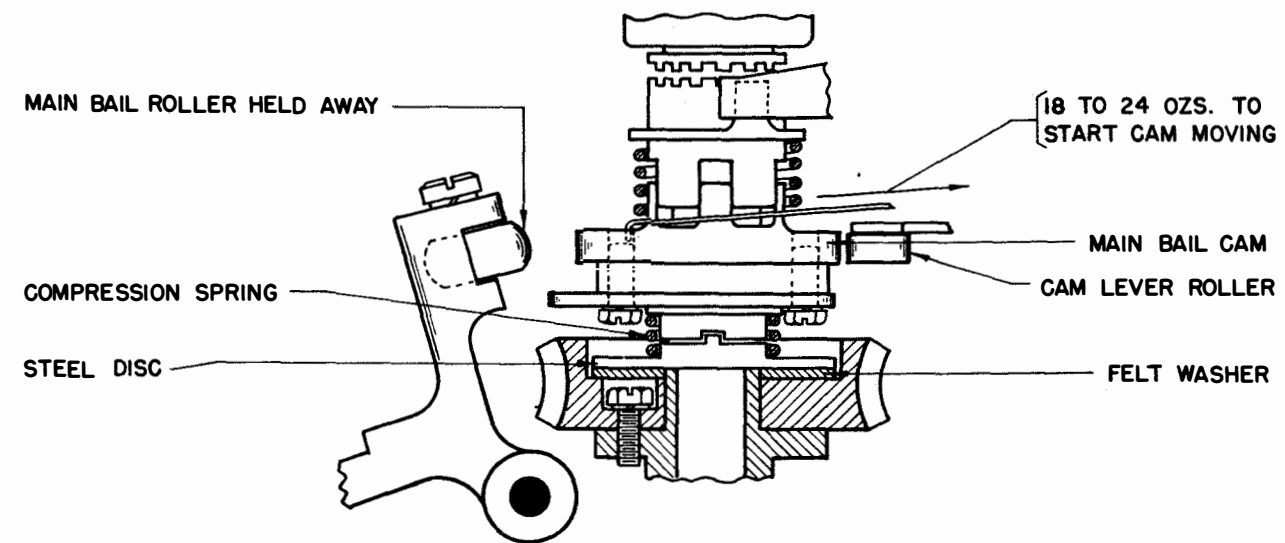


FIGURE 81

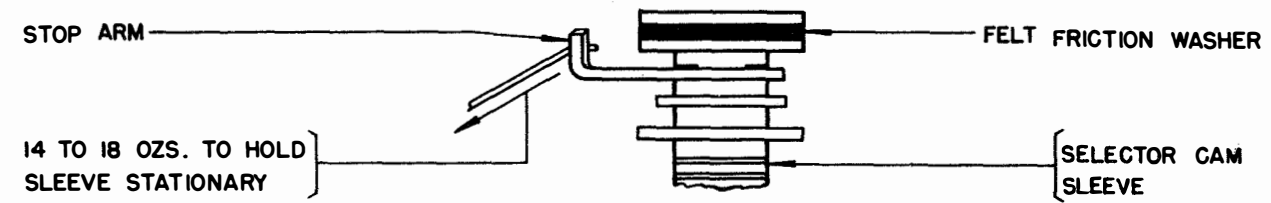


FIGURE 82

CHANGES IN LUBRICATION SPECIFICATIONS
WHICH APPLY TO ALL TELETYPE APPARATUS

The following lubricants have been standardized for use on all types of Teletype apparatus. These lubricants supersede those referred to in preceding Teletype specifications. The lubricants can be ordered from Teletype as follows:

88970	1 Qt. of KS-7470 Oil
88971	1 Gal. of KS-7470 Oil
88973	1 Lb. of KS-7471 Grease
*88975	KS-8319 Grease Gun
97116	4-oz. Tube of KS-7471 Grease

The above grease is recommended instead of oil for lubricating motors equipped with ball bearing. The 88975 grease gun should be used for injecting grease into the bearings of Teletype ball bearing motors. The gun may be used also for applying grease to other parts of the apparatus and no other grease container need be carried. If this grease gun is not available, the oil listed in the foregoing should be substituted for lubricating ball bearing motors.

* Instructions for Filling the Grease Gun

1. Unscrew the lubricant tube from the cap casting of the grease gun.
2. Insert fresh lubricant through the open end of the tube with the fingers. Apply gradually to eliminate air pockets.
3. Tamp the lubricant down solidly in the tube by pounding the closed end solidly against the palm of the hand. Continue to add lubricant until the tube is completely filled and the metal follower rests against the perforated tube cover.
4. Fill the cap casting with lubricant flush to the bottom side of the tube threads.
5. Screw the lubricant tube into the cap casting part way only. Then insert a pencil or rod through the perforated tube cover and exert pressure against the metal follower so as to expel any entrapped air past the tube threads. When lubricant begins to ooze through the threads, tighten the lubricant tube securely in the cap casting.
6. Operate the handle back and forth for several strokes or until lubricant is pumped from the nozzle. The gun is then ready for use. If the lubricant does not flow from the nozzle in a solid stream, it is an indication that all air has not been expelled from the lubricant tube. Invert the gun and pound the cap casting end against the palm of the hand to jar the lubricant into the pump cylinder.

* Instructions for Lubricating Motor Ball Bearings

The motor bearings are packed with grease before the motor leaves the factory and under ordinary operating conditions need no additional lubrication for

* Indicates change

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approximately two months. At the regular lubricating intervals one or two strokes of the plunger of the gun should apply sufficient grease to each bearing. To lubricate, press the nozzle of the gun against the ball oiler and force the grease into the hole by pushing on the plunger of the gun. Care should be taken that the bearings are not overloaded. Overloading will result in the grease oozing out of the end castings and being forced into the motor or being thrown on other parts of the mechanism. After lubricating, the motor should be run for a few minutes and then any excess grease that has been forced out of the ends of the castings should be wiped off. Each time that the gun is used for lubricating a motor bearing, the plunger should first be depressed slightly to make sure that grease will be delivered.

CHANGES AND ADDITIONS TO BULLETINS

127B, Issue 3, Model 14 Type Bar Tape Printer
138B, Issue 5, Model 15 Type Bar Page Printer
159B, Issue 2, Model 26 Type Wheel Page Printer
178B, Issue 1, Reperforator Transmitter
182B, Issue 1, Multiplex Start-Stop Extensor Set
197B, Issue 1, Multiple Reperforator Set
198B, Issue 1, Model 27 Type Wheel Page Printer
*199B, Issue 1, Simplex-Diplex Converter
*201B, Issue 1, Sequential Control (SECO) System
*203B, Issue 1, Reperforator Transmitter
*210B, Issue 1, Sequential Selector
*211B, Issue 2, Multiple Reperforator Transmitter
*220B, Issue 1, Model 14 Typing Reperforator

*127B, Page 9	*199B, Page 2-1
*138B, Page 22	*201B, Page 5-2
*159B, Page 1	*203B, Page 2-2
*178B, Page 4	*210B, Page 2-3
*182B, Page 12	*211B, Page 2-2
*197B, Page 11	*220B, Page 2-1
*198B, Page 14	

*SELECTOR MAGNET - Change the title and text of this adjustment to read as follows:

*(a) SELECTOR CORE AND ARMATURE ALIGNMENT - Preliminary

When the armature is in its operated position, it should touch both magnet pole faces approximately at their centers, and the cores should be located equi-distant, with respect to the outer edge of the armature as gauged by eye when a light reflector such as a piece of white paper is held behind the magnet. To adjust, remove the selector magnet bracket from the typing unit and reposition the magnet core assembly with its mounting screws loosened while holding the assembly so that the cores are vertical and the armature, by its own weight, rests against the pole faces. Tighten the magnet core assembly mounting screws and replace the selector magnet bracket.

*(b) SELECTOR CORE AND ARMATURE ALIGNMENT - Final

With the armature lever spring and the selector arm spring in position (hooked), manually rotate the shaft and selector cam sleeve so that the armature lever slowly moves the armature toward the magnet core. Observe that the armature touches both core ends simultaneously and approximately in the center of curvature; gauge by eye, holding a light reflector such as a piece of white paper behind the magnet and armature assembly. Adjust by repositioning the magnet core by means of its elongated mounting holes and mounting screws. Tighten the screws.

*NOTE 1: When the cores are in proper adjustment, it should require at least 3-1/2 pounds pull, with a 64 ounce scale applied at right angle to the armature edge in line with the armature lever, to separate the armature from the cores when a current of .020 amperes is flowing through the magnet coils (coils in series shunted by a 5000 ohm resistor).

*NOTE 2: The adjustment may have to be modified in order to obtain the required receiving margins and to prevent slow release of the armature due to oil-seal. The margin requirement and the minimum magnetic pull requirement of 3-1/2 pounds should be considered as "Final Check" for the armature and core alignment.

127B, Page 13	197B, Page 15
138B, Page 26	198B, Page 18
159B, Page 5	*201B, Page 5-4
178B, Page 9	*210B, Page 2-6
182B, Page 16	*211B, Page 2-5

SELECTOR ARM SPRING TENSION

Change this adjustment to read as follows:

Unhook the selector arm stop detent spring. With the armature extension on a high part of its cam, and the locking lever held away from the locking wedge, hook an 8 oz. scale over the end of the locking wedge and pull parallel to the selector arm spring. It should require 1-1/4 to 1-3/4 ozs. to start the selector arm moving. Reform the outer loop of the selector arm spring, if necessary, to meet this requirement. Replace the detent spring.

CAUTION: Care should be taken not to nick, crimp, or otherwise deform the spring or spring wire when reforming the loops.

*210B, Page 2-19

*SENSING BAIL - Add the following as a second paragraph to this adjustment:

*Release the timer blocking bail and rotate the main shaft until the No. 4 selector cam does not interfere with the movement of the timer sensing bail. Continue to rotate the timer cam sleeve until the blocking lever just drops off the high part of No. 4 timer cam. The tip of the latch bail pawl should rest on the low part of the No. 5 cam, there should be some clearance between the latch bail extension and the upper edge of the cut-out in the side plate of the unit and the upper edge of the blocking lever latching extension, when brought in alignment with the latching surface of the blocking lever latch should clear it by at least .010". If necessary, remove material from the upper edge of the cut-out in the side plate, covering the timer and selector mechanisms to keep out filing chips.

NOTE: Future Sequential Selector Units will have a larger cut-out in the side plate.

*210B, Page 2-20

*SENSING BALL SPRING TENSION

*Change the sensing ball spring tension requirement to read 3 to 5-1/2 ozs. instead of 2 to 3 ozs.

*

*

*

ADDITION TO BULLETINS

- Bulletin 127, Issue 3, Type Bar Tape Printer (Model 14), Page 36
- Bulletin 137, Issue 2, Typewheel Tape Printer (Ticker), Page 29
- Bulletin 138, Issue 5, Type Bar Page Printer (Model 15), Page 50
- Bulletin 141, Issue 3, Transmitter Distributor, Page 18
- Bulletin 147, Issue 2, Single Magnet Reperforator, Page 14
- Bulletin 159, Issue 2, Typewheel Page Printer (Model 26), Page 36
- Bulletin 160, Issue 1, Type Bar Page Printer (Model 20), Page 38
- Bulletin 170, Issue 1, Multiple Transmitter Distributor and Base, Page 9
- Bulletin 171, Issue 2, Typing Reperforator, Page 22
- Bulletin 175, Issue 1, Single Unit Transmitter and Base, Page 8
- Bulletin 176, Issue 1, Translator Unit, Receiving Distributor and Panel, Page 8
- Bulletin 178, Issue 1, Reperforator Transmitter Distributor, Page 46
- Bulletin 182, Issue 1, Multiplex Start-Stop Extensor Set, Page 22
- Bulletin 183, Issue 1, Portable Signal Distortion Test Set, Page 5
- Bulletin 185, Issue 1, Multiple Transmitter Distributors and Base, Page 12
- Bulletin 186, Issue 1, Two-Channel Start-Stop Transmitter Distributor, Page 20
- Bulletin 189, Issue 1, XD79 and XD95 Distributors, Page 15
- Bulletin 192, Issue 1, Teletype Automatic Wheatstone Perforator Set, Page 19
- Bulletin 193, Issue 1, Reperforator Transmitter Distributor (Model 14), Page 39
- Bulletin 197, Issue 1, Multiple Reperforator Set, Page 25

Add the following adjustment immediately preceding the "SPEED ADJUSTING WHEEL FRICTION WASHER SPRING TENSION ADJUSTMENT":

ADJUSTMENTS FOR ALIGNMENT AND SQUARENESS OF GOVERNOR CONTACTS

All governor contacts can be adjusted for alignment of edges; only those governor shells which provide elongated mounting holes for the fixed contact bracket permit adjustment of the contact for height by positioning the contact bracket.

The governor contacts should be in line and meet squarely so that maximum contact surface is provided. (Check with the retractile spring tension adjusted so that the contacts just make, or to the limit of the adjusting screw.)

- (a) Line up edges of contacts by means of the floating contact hinge mounting screw.
- (b) Adjust contacts for squareness from right to left by positioning the height of the fixed contact bracket using the elongated mounting holes in the governor shell.
- (c) To adjust from front to back, twist the floating contact hinge, applying pressure to the arm near the contact.

NOTE: Check by use of a .002" gauge (smaller if available). Check with gauge between edges of the contacts to see that the gauge enters (or does not enter) equally on all sides.

* * *

CHANGE IN
BULLETINS

- 127, Issue 3, Model 14 Type Bar Tape Printer, Page 22
- 171, Issue 2, Model 14 Typing Reperforator, Page 13
- 178, Issue 1, Reperforator Transmitter Distributor, Page 17
- 193, Issue 1, Model 14 Reperforator Transmitter Distributor, Page 14

RIGHT AND LEFT RIBBON REVERSE PAWLS SPRING TENSION

Change the tension requirement to read "1-3/4 to 3-3/4 ozs."
instead of "2-1/2 to 3-1/2 ozs."

CHANGES AND ADDITIONS TO
BULLETIN 178, ISSUE 1
ADJUSTMENTS - REPERFORATOR TRANSMITTER DISTRIBUTOR
(FRXD3 AND 4)
AND
BULLETIN 193, ISSUE 1
ADJUSTMENTS - MODEL 14
REPERFORATOR TRANSMITTER DISTRIBUTOR
(FRXD5)

On reperforator transmitter distributors equipped with the new transfer slides casting (115515), which replaces the 102192 and 102193 brackets and associated sheet metal parts, the following changes in adjustments and adjusting sequence applies:

BULLETIN 178, PAGE 33
BULLETIN 193, PAGE 29

Following the instruction - "REMOVE THE TRANSFER BAIL AND SLIDE ASSEMBLY FROM THE BASE CASTING TO MAKE THE FOLLOWING ADJUSTMENTS:" - the adjusting text should read:

TRANSMITTER CONTACT OPERATING BAILS ADJUSTMENT

The transmitter contact operating bails should be centrally located between the casting supports and the bails should rotate freely on their bearing shaft with some end play, not more than .005". To adjust, loosen the set screws of both set collars and centrally locate the entire assembly along its shaft and tighten the screws on one set collar. Position the other collar for the specified clearance when the play in the bails is taken up in a direction toward the collar previously adjusted. Tighten the set screws in the adjusted set collar.

Unhook the transfer bail spring and loosen the set screws on the lower slide bar eccentric shaft collars.

LOWER TRANSFER SLIDE BAR ECCENTRIC SHAFT PRELIMINARY ADJUSTMENT

Same as now specified in bulletin.

UPPER TRANSFER SLIDE BAR SHAFT COLLAR ADJUSTMENT

The transfer slides should line up with their associated transmitter contact operating bails and there should be some side play, not more than .010". To adjust, loosen the collar set screws of both set collars and position one collar so that the transfer slides each line up with their associated contact operating bail when all the slides are held towards this collar. Tighten its set screws. Position the other set collar so that the slide bars move freely and have the specified side play. Tighten its set screws.

LOWER TRANSFER SLIDE BAR ECCENTRIC SHAFT COLLAR ADJUSTMENT

The transfer slide bars should be perpendicular to their shafts, move freely in their guides, and there should be some end play, not more than .010", between a set collar on the lower eccentric shaft and the adjacent slide bar when the play is taken up in a direction away from the collar. To adjust, position the set collars by means of their set screws. Tighten the set screws.

TRANSFER LEVER RAIL ADJUSTMENT

Same as now specified in bulletin.

* * *

CHANGES AND ADDITIONS TO BULLETINS

178, Issue 1 - Adjustments, Reperforator Transmitter
193, Issue 1 - Adjustments, Reperforator Transmitter
203, Issue 1 - Adjustments, Reperforator Transmitter

BULLETIN 178, PAGES 3 and 4
BULLETIN 193, PAGES 1 and 2
BULLETIN 203, PAGE 2-1
MAIN SHAFT ADJUSTMENT

Change this adjustment to read:

The cams - - - - - main shaft. Tighten the screw. On units equipped with a 117387 lower bearing retainer, the following applies: Tighten the upper cap mounting screws. Position the bearing retainer on the lower bearing cap so that the bridge rests against the upper face of the ball bearing and that it clears the lower bearing cap. Tighten the lower bearing cap mounting screws.

BULLETIN 178, PAGE 4
BULLETIN 193, PAGE 2
BULLETIN 203, PAGE 2-2
MOTOR POSITION AND GEAR MESH ADJUSTMENT

Change this adjustment to read as follows:

With the motor base plate eccentric stop approximately in the center of its adjustment and with the base plate resting against this stop, a horizontal center line through the main shaft gear should coincide approximately with a horizontal line through the center of the pinion. If necessary adjust the height of the motor by means of shims between the motor feet and the base plate. Use the same number of shims under each motor foot. The shims not used should be retained beneath their respective mounting screw lock washers to prevent the screws from protruding beneath the base plate.

Position the motor on its base plate by means of its mounting screws and the elongated holes so that there is a barely perceptible amount of backlash between the motor pinion and the main shaft gear; check for one complete revolution of the main shaft gear.

Note: The gear play may be refined by pivoting the motor base plate about the left-hand screw and by readjusting the eccentric stop.

BULLETIN 178, PAGE 10
BULLETIN 193, PAGE 8
BULLETIN 203, PAGE 2-5
MANUAL TAPE - OUT MECHANISM ADJUSTMENT

In Bulletin 178 delete the first and second sentences.

In Bulletin 193 delete the first paragraph.

In Bulletin 203 delete paragraph (a).

Add the following in place of the deleted material:

The round tip of the clutch release lever should be positioned approximately midway between the trip latch plunger and the bracket, and the clutch release lever should not limit the upper range movement of the indicator arm on the range finder scale.

BULLETIN 178, PAGE 14
BULLETIN 193, PAGE 12
BULLETIN 203, PAGE 2-7

LEFT RIBBON-SPOOL SHAFT ADJUSTMENT

The first sentence should read: The left ribbon-spool shaft should have some end play, not more than .010".

Change corresponding figure accordingly.

LEFT RIBBON-SPOOL DRIVE SHAFT ADJUSTMENT

In Bulletin 178, delete the first line of this adjustment.

In Bulletin 193 and Bulletin 203, delete the second sentence.

Change corresponding figure accordingly.

BULLETIN 178, PAGE 15
BULLETIN 193, PAGE 12
BULLETIN 203, PAGE 2-8

LEFT RIBBON REVERSE-ARM SHAFT ADJUSTMENT

Change the end play requirement from "not more than .004" to read: not more than .010".

Change corresponding figure accordingly.

RIGHT RIBBON SPOOL SHAFT ADJUSTMENT

Change the end play requirement from "not more than .004" to read: not more than .010".

Change corresponding figure accordingly.

BULLETIN 178, PAGE 18

Add the following adjustment after CODE BAR LOCKING LEVER SPRING BRACKET ADJUSTMENT* (FRXD** only):

BULLETIN 193, PAGE 14

Add the following adjustment after CODE BAR LOCKING LEVER SPRING TENSION:

BULLETIN 203, PAGE 2-9

Omit paragraph 2h(29)(b) (PULL BAR GUARD ADJUSTMENT) and add the following adjustment immediately after paragraph 2h(28) (CODE BAR LOCKING LEVER SPRING TENSION):

PULL-BAR GUARD ADJUSTMENT

1. With the main bail in its normal downward position, the 98479 pullbar guard should be adjusted to meet the following requirements for the end pull bars:
2. With the type bar against the platen there should be some clearance, as gauged by eye, between the pull bar and the 98479 pull-bar guard.
3. The same clearance should be obtained for pull bars not having type bars associated with them. To check this adjustment, raise the pull bar by hand to a point where there is a minimum clearance between the pull bar and the pull-bar guard when the pull bar is in contact with the main bail. (Shift the platen to the proper position to permit raising of pull bar.)
4. With the type bars against their backstop it should not be possible to manually disengage the pull bars from their guide slots. If the pull bars strike the guard when the type bar is against the platen, remove washers from the side on which this difficulty occurs. If pull bars can be pulled out of their slots, add washers on the side on which difficulty occurs. If the 7002 washers do not result in a correct adjustment, replace one of them with with a number of 8896 shims. (The 7002 washer is .028" thick; the 8896 shim is .004" thick.)
5. To adjust the 98479 pull-bar guard, loosen one of its mounting screws and position the end of the guard by pushing or pulling as required so that the center pull bars meet the requirements specified under 2. and 3. Tighten the mounting screws securely. Recheck 2., 3., and 4.

BULLETIN 178, PAGE 18

BULLETIN 193, PAGE 15

BULLETIN 203, PAGE 2-11

POSITIVE SHIFT AND PLATEN MECHANISM ADJUSTMENT

In Bulletin 178, delete "TO MAKE THE - - - - THE FOLLOWING MANNER:"

In Bulletin 193 and 203, delete the title "POSITIVE SHIFT AND PLATEN MECHANISM ADJUSTMENT" and the Note.

In each bulletin substitute the following for the deleted material:

"IF IT BECOMES NECESSARY TO REMOVE THE CODE PUNCH AND PREPUNCH ASSEMBLIES TO MAKE THE FOLLOWING 12 ADJUSTMENTS, THEY SHOULD BE REMOVED AS FOLLOWS:"

BULLETIN 178, PAGE 21

BULLETIN 193, PAGE 18

BULLETIN 203, PAGE 2-13

The MAIN BAIL ADJUSTING SCREW FINAL ADJUSTMENT should follow immediately after the MAIN BAIL SPRING TENSION ADJUSTMENT PRELIMINARY.

BULLETIN 178, PAGE 20
BULLETIN 193, PAGE 17
BULLETIN 203, PAGE 2-12
SELECTOR-FINGERS RETAINING BRACKET ADJUSTMENT

Change the first sentence to read: The selector fingers should have from .006" to .015" up and down play in the slots.

BULLETIN 178, PAGE 21
BULLETIN 193, PAGE 17
BULLETIN 203, PAGE 2-12
CODE BAR BELL CRANKS ADJUSTMENT

Change the second paragraph to read as follows:

*With the code bars positioned for BLANK selection, rotate the main shaft until the right ends of the code bars and the adjacent parallel edges of the associated code bar bell cranks are at the point of closest approach. Under this condition the clearance at this point should be .010" to .050".

BULLETIN 193, PAGE 18
BULLETIN 203, PAGE 2-13
VERTICAL LINK PIVOT(STUD) SCREW ADJUSTMENT

In Bulletin 193, paragraph (4) and Bulletin 203, paragraph (d) before the words "punch selector" insert the word: unselected.

BULLETIN 178, PAGE 21
BULLETIN 193, PAGE 18
BULLETIN 203, PAGE 2-13
VERTICAL LINK PIVOT SCREW ADJUSTMENT

After the last paragraph add the following:

Note: Four of the six 95417 separator plates have been redesigned to reduce the end play in the vertical link lower bell crank. The following new adjustment applies to reperforator transmitters equipped with the newly designed parts.

VERTICAL LINK LOWER BELL CRANK SEPARATOR PLATE ADJUSTMENT

With the main bail in its lowermost position, the separator plates (without extension) should be approximately in line with each other horizontally. The separator plate with the extension should be positioned to provide from .005" to .020" clearance between the top edge of the No. 1 bell crank and the bottom side of the plate extension at the closest point, and there should be some clearance between the bottom side of the plate extension and the top edge of the other four bell cranks. Make certain that the vertical parts of the bell cranks are safely re-

tained (by at least 1/3 the width of the bell crank) within their guide slots when the horizontal end is held against the separator plate extension. To adjust, position the separators on the bell crank stud, and if necessary, bend the plate extension to meet the requirements. Tighten the nut. Do not loosen the stud.

Note: Make certain that the locking pull bar does not bind against the code bar bell cranks when the main bail is in its lowermost position.

BULLETIN 193, PAGE 19

BULLETIN 203, PAGE 2-13

CODE PUNCH BLOCK FEED ROLL SHIMS ADJUSTMENT

In paragraph (3) or 3., after the word "With" insert the following words: the BLANK combination selected and - - - - -.

BULLETIN 178, PAGE 22

BULLETIN 193, PAGE 19

BULLETIN 023, PAGE 2-13

CODE PUNCH BLOCK FEED ROLL SHIMS ADJUSTMENT

In Bulletin 178, paragraph (9), Bulletin 193, paragraph (8), Bulletin 203, paragraph 9. delete this paragraph and substitute the following therefor:

With the BLANK combination selected, rotate the shaft until the punch arm roller is on the high part of its cam. Place the punches of the code punch assembly in the lowermost position, move the detent roller out of the way of the feed-roll ratchet and hold the feed pawl so that it passes through its slot of the block assembly.

Engage the punches and the guide shoulder screws of the punch block assembly in the retractor slots and replace the front punch block mounting screw friction tight.

Hold the pivoted transmitter against the punch block and locate the block, within the limits of its mounting holes, parallel to the edge of the pivoted transmitter guide plate. Replace the rear screw and tighten both mounting screws.

Note: It may be necessary to move the ribbon guide out of the way.

Rehook the feed roll detent lever spring. Check the following adjustments:

- Code Punch Feed Pawl
- Code Punch Feed Roll Detent (Final)
- Code Punch Tape Guide
- Ribbon Guide
- Pivoted Transmitter Bracket Shims
- Pivoted Transmitter Pilot Screws
- Pivoted Transmitter Tape-Guide Plate

Tape Pin Oscillator Backstop Screw
Tape Depressing Bail

BULLETIN 178, PAGE 24
BULLETIN 193, PAGE 20
BULLETIN 203, PAGE 2-14

CLUTCH MAGNET BRACKET ADJUSTMENT

Delete paragraph (3) or (c) and substitute the following therefor:

With the driving members positioned in the center of their elongated holes (preliminary) and with the armatures held in the operated position, there should be .010" to .040" clearance between the high part of the driven clutches and their respective clutch throwout levers. The armatures should be parallel to the shafts and with the armatures in the unoperated positions, the clutch throwout levers should disengage both clutches with approximately .005" clearance between the clutch teeth. To adjust, position the clutch magnet bracket by means of the mounting screws.

*On units equipped with the 120682 armature release spring on the 102113 clutch magnet bracket assemblies insert the following adjustment between items 2 and 3 of the CLUTCH MAGNET BRACKET ADJUSTMENT in Bulletin 193, and between items (b) and (c) in Bulletin 203:

The release spring should rest against the top insulators of all four magnet coils; if necessary adjust by bending the legs of the spring. With the throwout lever springs removed, adjust the two center leaves by bending so that there is from .008" to .012" clearance between the magnet cores and the armatures, at the closest points. The armature to be checked should touch the leaf-extension of the release spring, while the other armature is held in the unoperated position.

NOTE: See that the operating edges of the leaf-extensions are parallel to their corresponding armatures; gauge by eye.

With the push end of a 32 oz. scale applied horizontally to the outer edge of each armature, approximately in the center, it should require at least 12 ozs. to push the armatures until they just touch the cores.

Replace the clutch throw-out lever springs.

BULLETIN 178, PAGE 25
BULLETIN 193, PAGE 21
BULLETIN 203, PAGE 2-15

SENSING AND DISTRIBUTOR CLUTCH SPRING TENSION

Change the spring tension requirement from "9 to 12 oz." to read:
12 to 17 ozs.

Change corresponding figure accordingly.

PREPUNCH TAPE GUIDE ADJUSTMENT

To the last sentence at the end of this adjustment add the following:
using tool No. 99947.

BULLETIN 178, PAGE 26
BULLETIN 193, PAGE 23
BULLETIN 203, PAGE 2-16
*PREPUNCH ADJUSTMENT

Change the title of this adjustment to:

PREPUNCH OPERATING BAIL ECCENTRIC PRELIMINARY ADJUSTMENT

*PREPUNCH FEED PAWL ECCENTRIC FINAL ADJUSTMENT

Change this adjustment to read as follows:

Note: When checking the following requirements, the tape tension lever must be held away from the feed roll.

With the detent roller in engagement with the feel-roll star wheel, rotate the receiving shaft until the feed pawl is in its uppermost position. Hold the detent roller away from the star wheel and continue to rotate the receiving shaft until the feed pawl is in its lower-most position. The feed roll should have rotated one full step.

To check, allow the feed roll detent lever roller to come in engagement with the feed roll star wheel. The star wheel should not rotate in a clockwise direction and the clearance between the detent roller and the face of the tooth directly below the roller should not exceed .015".

Check these requirements at four points on the star wheel, approximately 90° apart.

To adjust, position the feed pawl eccentric.

*Add the following adjustment after the "PREPUNCH FEED PAWL ECCENTRIC FINAL ADJUSTMENT".

PREPUNCH OPERATING BAIL ECCENTRIC FINAL ADJUSTMENT

Rotate the receiving shaft from its stop position until the prepunch feed pawl starts its downward movement. Place a .006" flat gage in the tape slot of the prepunch block and continue to rotate the receiving shaft until the gage just slides under the prepunch pin. In this position there must be some clearance between the face of the feed pawl and the face of a tooth on the feed roll. Check for clearance of each tooth on the feed roll by rotating the feed roll in a counterclockwise direction. To adjust, rotate the receiving shaft until the feed pawl just engages a tooth on the feed roll, then readjust the prepunch bail eccentric until a .006" flat gage just slides under the punch pin.

BULLETIN 178, PAGE 27
BULLETIN 193, PAGE 23
BULLETIN 203, PAGE 2-16

PREPUNCH OPERATING-BAIL SPRING TENSION (PREPUNCH ARM SPRING TENSION
in Bulletin 193)

Change the spring tension requirement to read 3-1/2 to 5-1/2 lbs.

Change corresponding figure accordingly.

BULLETIN 178, PAGE 27
BULLETIN 203, PAGE 2-16

PREPUNCH FEED-PAWL RELEASE-LEVER SPRING TENSION

Change this spring tension requirement to 2 to 5 ozs.

Change corresponding figure accordingly.

BULLETIN 193, PAGE 24

CODE PUNCH FEED ROLL DETENT SPRING TENSION

Change the spring tension requirement from "6 to 12 ozs." to read:
6 to 9 ozs. Change corresponding figure accordingly.

BULLETIN 178, PAGE 28
BULLETIN 193, PAGE 24
BULLETIN 203, PAGE 2-17

CODE PUNCH FEED PAWL SPRING TENSION

Change this adjustment to read as follows:

With the unit in its stop position and the feed-roll detent lever held away, hook an 8 oz. scale to the feed pawl at the spring hole and pull in line with the spring. It should require 3-1/2 to 6 ozs. to start the pawl moving away from the ratchet wheel.

SELECTOR-FINGER BELL-CRANK SPRING TENSION

On units equipped with the 42661 spring (20 turns), change the spring tension requirement to read 2-1/4 to 3-1/4 ozs.

BULLETIN 178, PAGE 29
BULLETIN 193, PAGE 25
BULLETIN 203, PAGE 2-17

RIBBON GUIDE ADJUSTMENT

After this adjustment add the following note:

Note: On some units one or two 90560 washers have been added to each of the ribbon guide mounting screws and are initially assembled between the ribbon guide and the mounting screw head. When the reperfocator transmitter is equipped with FRACTION type pallets, one or more of these washers may be relocated between the ribbon guide and the tape guide in order to assure printing of the entire character.

CODE-PUNCH TAPE GUIDE ADJUSTMENT (TAPE GUIDE ADJUSTMENT)

Change this adjustment to read as follows:

The tape should enter the code punch block without buckling. A center line through the tape code holes of a LETTERS combination should be at right angle to the edges of the tape. To check, open the lids of two LETTERS perforations spaced approximately 2" apart, fold the tape back between these holes, line up the edges of the tape and see that the trailing edges of the code holes line up with each other; gage by eye. Observe that this method of checking doubles the amount of "out-of-line" condition. To adjust, loosen the code-punch tape-guide mounting screws and position the guide; tighten the screws.

BULLETIN 203, PAGE 2-17, Paragraph 2h(77)

Change the title to read: CODE-PUNCH FEED-ROLL DETENT AND CODE-PUNCH FEED-PAWL FINAL ADJUSTMENT.

BULLETIN 178, PAGE 29

BULLETIN 193, PAGE 25

BULLETIN 203, PAGE 2-17

PUNCH RETRACTOR SPRINGS TENSION

Change this requirement to read as follows:

With the punch arm roller on the low part of its cam and with the selector fingers in their spacing position (extreme right), hook a 12 lb. scale under the center of the retractor - balance the position of the scale until both sides of the retractor leave their stops simultaneously (may require placing the scale under the number 3 punch pin) - and pull vertically upward. It should require 5-1/2 to 8 lbs. to start the punch retractor moving away from the stops.

Change corresponding figure accordingly.

BULLETIN 178, PAGE 29 - PIVOTED TRANSMITTER PILOT SCREWS ADJUSTMENT

BULLETIN 193, PAGE 25 - HORIZONTAL ALIGNMENT OF PIVOTED TRANSMITTER

BULLETIN 203, PAGE 2-17 - PIVOTED TRANSMITTER PILOT SCREWS ADJUSTMENTS

Omit the requirement "not more than .003" and substitute the following therefor: without binds.

BULLETIN 178, PAGE 29

BULLETIN 193, PAGE 26

BULLETIN 203, PAGE 2-17

PIVOTED TRANSMITTER TAPE GUIDE PLATE ADJUSTMENT

Delete this adjustment and substitute the following therefor:

With the pivoted transmitter in its midway (between its extreme left and right) position, release the sensing shaft clutch lever and rotate the motor until the distributor clutch release contact lever drops off the high part of its cam and until the "Y" levers are about ready to drop off their cams. In this position the sensing pins should be approximately in the center between the hinged edge and the trailing edge of the code holes in the perforated tape, and the center line through each pin (parallel to the edges of the tape) should be approximately in line with the center line through its code hole. To meet these requirements, position the tape guide plate from left to right and from front to rear while rechecking the foregoing adjustment. Check to see that the sensing pins do not touch the edges of their code holes when the pivoted transmitter is:

- a. one space away from the die block
- b. in its midway position and
- c. in its extreme left-hand position

To make this check, rotate the motor slowly and observe the sensing pins when they are lifting up the lids.

BULLETIN 178, PAGE 30

BULLETIN 203, PAGE 2-18

TAPE-PIN OSCILLATOR BACKSTOP SCREW ADJUSTMENT

Insert this adjustment before the PIVOTED-TRANSMITTER TAPE GUIDE PLATE ADJUSTMENT.

BULLETIN 203, PAGE 2-19, Paragraph 2h(93)(b)4.

Omit this requirement.

BULLETIN 178, PAGE 32

BULLETIN 203, PAGE 2-19

Change the FEED PIN OSCILLATOR SPRING TENSION requirement to read: 1 to 3 ozs.

Change corresponding figure accordingly.

BULLETIN 193, PAGE 30

BULLETIN 203, PAGE 2-21

Omit the sentence: "THE SWITCHING-CONTROL-CONTACT ASSEMBLY SHOULD BE REMOVED BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENT."

BULLETIN 203, PAGE 2-21, Paragraph 111

Change heading to read: TRANSFER BAIL-AND-SLIDE ASSEMBLY PRELIMINARY ADJUSTMENT.

Paragraph 102. Omit the word "PRELIMINARY" from the title.

BULLETIN 178, PAGE 35
BULLETIN 193, PAGE 31
BULLETIN 203, PAGE 2-22

Change the spring tension requirement in item four of the DISTRIBUTOR CONTACT ADJUSTMENT to read: 8 to 10 ozs.

Change corresponding figure accordingly.

BULLETIN 193, PAGE 33
BULLETIN 203, PAGE 2-23
TAPE-OUT CONTACT ADJUSTMENT

In the third paragraph change the .010" to .020" clearance gap requirement to read ".010 to .030".

After the third paragraph add the following note:

Note: With the tape removed from the transmitter, make certain that the contacts are closed and that each short contact spring moves away from its stiffener.

Change corresponding figure accordingly.

BULLETIN 178, PAGES 39 and 40
BULLETIN 193, PAGE 34
BULLETIN 203, PAGE 2-24
DISTRIBUTING AND SENSING CLUTCH THROWOUT-LEVER SPRING TENSION

Change the spring tension value of the lower armature spring to read: "3 to 5 ozs." Change the spring tension value of the upper armature spring to read "5 to 7 ozs."

BULLETIN 203, PAGE 2-25
The SWITCHING CONTROL CONTACT ASSEMBLY should read as follows:

SWITCH-CONTROL CONTACT ASSEMBLY

Note: Slack in the cable to the switching contacts permits the entire contact assembly to be removed a short distance from the base of the unit.

(a) CONTACT AND SPRING TANG ALIGNMENT

1. The alignment of the contacts should be within the limits indicated in Figure 76 in Bulletin 203 or Figure 70 in Bulletin 193.

2. The width of each spring tang should lie entirely within the slots in the comb. Gauge by eye.

3. The spring studs should clear the springs through which they pass in all positions of travel of the studs.

4. To adjust, loosen the contact spring mounting screws so that they are friction tight and align the contact springs. Tighten the mounting screws.

Note: The contact pile-ups are preheated in the factory and the clampings screws are tightened with the pile-ups under pressure; therefore, these screws should be loosened only when absolutely necessary and tightened in such a manner that the contact springs do not shift after clamping.

(b) COMB ALIGNMENT

The springs tangs should rest in the slots of the comb so that there is approximately equal clearance from the free end of the tang to the bottom of the slot, gauged on the two end springs with tangs. (See Figure 77 in Bulletin 203 or Figure 71 in Bulletin 193.) Adjust by means of mounting screws and enlarged holes in the comb.

(c) SPRING TENSION ADJUSTMENTS

1. Before applying any of the following spring tension adjustments, all the springs should be definitely tensioned toward the narrow end of the comb so that they exert some tension against the adjacent contact spring, comb, etc.

2. Unless otherwise specified, the tension should be measured with the springs in the normal unoperated position.

3. Both sections of bifurcated (split) springs should be in alignment with each other so that the contacts on the bifurcated springs break or make with the contacts on associated springs approximately at the same time.

4. A spring whose contacts are tensioned against the comb or an opposing spring, or a stud, should register the required tension just as the tang leaves the comb, or just as the contacts break, or just as it leaves the stud.

5. When gauging tensions on solid springs the tip of the gauge should be applied near the end of the spring just in front of the contacts. When checking tensions of swingers, the tip of the gauge should be applied to both parts of the bifurcated springs, just above the contact points.

6. There should be a clearance between adjacent springs, whether in the operated or unoperated position, of minimum .008". Gauge by eye.

7. Refer to Figure 78 in Bulletin 203 or Figure 72 in Bulletin 193 for position and number of contacts which apply in the following adjustments:

a. The heavy contact springs with tangs are Nos. 1, 3, 5, 6, 8, 9, 11 and 12. The tangs of these springs should be in alignment with the main body of the spring before starting adjustments.

b. These springs should register 30 to 50 gms. just as the tang of the spring leaves the comb.

Note: In tensioning springs Nos. 5, 8, and 11, the load of the opposing springs should be removed by pressing the right-hand stud to the left.

c. Spring No. 2 should be tensioned toward the right so that its stud is in contact with the No. 4 spring. The No. 2 spring should register 6 to 12 gms. just as its stud leaves the No. 4 spring.

d. Spring No. 4 should register 18 to 25 gms. just as it breaks contact with the opposing spring.

Note: The No. 2 spring stud should be resting against the No. 4 spring when measuring tension.

e. Spring No. 7 should register 18 to 25 gms. just as it breaks contact with the No. 8 spring, and there should be some clearance, not more than .003", between the stud of the No. 7 spring and No. 4 spring. To adjust, bend the bow No. 7 spring. If further refinements are necessary, the tang on No. 8 spring may be bent slightly.

Note: In making this adjustment, some clearance should be maintained between the No. 10 spring and the stud on No. 7 spring. Hold No. 10 spring away by hand.

f. Spring No. 10 should register 18 to 25 gms. just as it breaks contact with the No. 11 spring, and there should be some clearance, not more than .003", between the stud of the No. 7 spring and the No. 10 spring. To adjust, bend and bow No. 10 spring. If further refinements are necessary, the tang on No. 11 spring may be bent slightly.

(d) CONTACT PILE-UP ALIGNMENT

1. PRELIMINARY. With the transfer slides in the spacing (lower) position and the slots in all the contact-operating bail eccentrics in a vertical position (high side up or down according to the position that gives the fullest engagement between the end of the plunger and the curvature of the eccentric) the gap between the stud, on No. 13 spring and the No. 10 spring should be .010" to .015" on the Number 1 and the Number 5 contact pile-up assemblies. To adjust, loosen the two eccentric-stop mounting screws and rotate the eccentrics away from the brackets. Loosen the contact-bracket mounting screws and position the bracket. Tighten the mounting screws. Rotate the eccentrics so they make contact with the bracket and tighten the eccentric mounting screws.

2. The right-hand stud on each pile-up should be centrally aligned with its associated contact-bail eccentric. Align each contact pile-up by means of its mounting screws and the enlarged holes in the mounting plate.

3. The clearance between the stud of No. 13 spring and No. 10 contact spring of each pile-up should be .005" to .015"; adjust by positioning the contact bail eccentrics.

4. With the transfer slides in their lower SPACING position, spring No. 13 in each pile-up should register 18 to 25 gms. just as the stud leaves the slide-lever eccentric. To adjust, bend and bow the No. 13 spring.

5. With the slide levers in their SPACING (lower) position, adjacent contact springs Nos. 1 and 2, 3 and 4, 6 and 7, 9 and 10, 12 and 13, should "make" with a .035" gauge, and "not make" with a .025" gauge placed between the transfer-slide eccentrics and their respective studs. To adjust, bend the tangs on springs Nos. 1, 3, 6, 9, and 12, and recheck tension requirements in Paragraph 7. under SPRING TENSION ADJUSTMENTS.

6. Recheck contact spring tensions as outlined in paragraphs 7.b.c.d. e.f. above.

7. With the slide levers in their SPACING (lower) position, there should be at least .008" clearance between the contact points of the light contact springs and those of the associated left-hand heavy springs; with the slides in the MARKING (upper) position, check for at least .008" clearance between the contact points of the light springs and those of the associated right-hand heavy springs.

8. With the slides in the MARKING position, move the heavy left-hand contact springs away from their backstops (or from the light springs) and see that there is some "follow" of the light contact springs.

BULLETIN 178, PAGE 50
BULLETIN 193, PAGE 42
BULLETIN 203, PAGE 2-30

Under MAIN SHAFT in item (4), after the word "grease", insert the following words: lower, oil (upper).

After item (7) insert the following: (7.1) Main clutch bushing-saturate wick with oil; 2 oil holes.

BULLETIN 178, PAGES 52 and 53
BULLETIN 193, PAGES 44 and 45
BULLETIN 203, PAGE 2-32

LUBRICATION: Under sensing shaft and distributing shaft, add the following as item (10) in each case: "(10) cam sleeve felt wicks - saturate with oil."

BULLETIN 203, FIGURE 44

Change the designation "6 to 12 ozs." to read: 6 to 9 ozs.

CHANGES AND ADDITIONS TO

Bulletin 178, Issue 1, Adjustments - Reperforator Transmitter (Model 14)
Bulletin 193, Issue 1, Adjustments - Reperforator Transmitter (Model 14)
Bulletin 203, Issue 1, Adjustments - Reperforator Transmitter (Model 14)

BULLETIN 178, Page 17
BULLETIN 193, Page 14
BULLETIN 203, Page 2-9

RIBBON FEED PAWL SPRING PRESSURE ADJUSTMENT

Change this adjustment to read as follows:

With the ribbon feed shaft pushed to the right, the main shaft in its stop position and an 8 oz. scale hooked over the extreme front edge of the ribbon feed pawl and pulled at right angle to the pawl, it should require 6 to 8 ozs. to start the pawl moving away from the ribbon feed ratchet. Make certain that the feeding edge of the pawl does not bind against a tooth on the ratchet when tension is being measured. To adjust, bend the ribbon feed pawl spring.

BULLETIN 178, Page 20
BULLETIN 193, Page 17
BULLETIN 203, Page 2-12

SHIFT-LATCH SPRING TENSION

On units equipped with the 84575 Spring (27 turns) instead of the 35-70 Spring (37 turns), change the requirement to read: 1/4 to 1 oz. from "not more than 1 oz."

Change corresponding figure accordingly.

BULLETIN 178, Page 31
BULLETIN 193, Page 27
BULLETIN 203, Page 2-19

Y-LEVER SPRING TENSION

Change the requirement from 1 to 2-1/2 ozs. (1 to 2 ozs. - B-193 to read: 2 to 3 ozs.

Change corresponding figures accordingly.

BULLETIN 178, Page 35
BULLETIN 193, Page 31
BULLETIN 203, Page 2-22

After TRANSFER BAIL SPRING TENSION adjustment add the following:

NOTE: The 7614 transfer bail spring (25 turns, .133" dia., .020" wire) is used only with the old style Transfer Bail Assembly Mounting Bracket. The 41385 transfer bail spring (15 turns, .184" dia., .024" wire) is used only with the 115515 new style bracket (casting).

BULLETIN 193

Page 31 TRANSFER BAIL SPRING TENSION

Change the spring tension requirement from 6 to 7 ozs. measured with an 8 oz. scale, to 9 to 11 ozs. measured with a 32 oz. scale.

Pages 37 and 38 CONTACT PILE-UP ALIGNMENT

In Item (7) on Page 38 change the "not make" value from .030" gauge to .025" gauge. After Item (7) on Page 38 add the following:

(8) Recheck contact spring tensions as outlined in Paragraphs (1), (2), (3), (4), (5), at bottom of Page 36 and top of Page 37.

(9) With the slide levers in their SPACING (lower) position, there should be at least .008" clearance between the contact points of the light contact springs and those of the associated left-hand heavy springs; with the slides in the MARKING (upper) position, check for at least .008" clearance between the contact points of the light springs and those of the associated right-hand heavy springs.

(10) With the slides in the MARKING position, move the heavy left-hand contact springs away from their backstops (or from the light springs) and see that there is some "follow" of the light contact springs.

BULLETIN 178, Page 36

BULLETIN 193, Page 33

BULLETIN 203, Page 2-23

DISTRIBUTOR-CLUTCH RELEASE CONTACT ADJUSTMENT

Change the requirement for the distributor clutch release contact spring from 7 to 12 ozs. to read: 9 to 12 ozs.

Change corresponding figures accordingly.

BULLETIN 178, Page 49

BULLETIN 193, Page 35

BULLETIN 203, Page 2-25

MAIN BAIL CAM CLUTCH TORQUE

Insert the following immediately after this requirement.

Note: For field maintenance purposes the torque may drop to 12 ozs. minimum before readjustments or replacements of parts are required.

* * *

ADDITION TO ADJUSTMENT BULLETINS

- Bulletin 127, Issue 3 - Type Bar Tape Printer (Model 14), Pages 7, 13
- Bulletin 138, Issue 5 - Type Bar Page Printer (Model 15), Pages 21, 26
- Bulletin 147, Issue 2 - Single Magnet Reperforator, Page 6
- Bulletin 155, Issue 1 - Start-Stop Regenerative Repeater, Page 8
- Bulletin 159, Issue 2 - Type Wheel Page Printer (Model 26), Page 6
- Bulletin 160, Issue 1 - Type Bar Page Printer (Model 20), Page 16
- Bulletin 165, Issue 3 - Typing Reperforator (Model 14), Pages 2-5, 2-8
- Bulletin 171, Issue 2 - Typing Reperforator, Page 7
- Bulletin 178, Issue 1 - Reperforator Transmitter Distributor, Page 9
- Bulletin 182, Issue 1 - Multiplex Start-Stop Extensor Set, Page 17
- Bulletin 193, Issue 1 - Reperforator Transmitter Distributor (Model 14), Page 8
- Bulletin 197, Issue 1 - Multiple Reperforator Set, Page 16
- Bulletin 198, Issue 1 - Type-Wheel Page Printer (Model 27), Page 18
- Bulletin 199, Issue 1 - Simplex-Diplex Converter, Page 2-4
- Bulletin 201, Issue 1 - Sequential Control (SECO) System, Page 5-5
- Bulletin 203, Issue 1 - Reperforator Transmitter (Model 14), Page 2-5
- Bulletin 204, Issue 1 - Sequential Selector (SOTUS), Page 3-6

The following adjustment applies to units equipped with the Adjustable Range Scale Assembly which permits regulation of the engagement between the stop arm on the selector cam sleeve and the stop lever on the range finder. The adjustment should be made immediately after the STOP LEVER SPRING TENSION ADJUSTMENT; bulletins and affected pages are listed above.

SELECTOR STOP ARM AND STOP LEVER ENGAGEMENT ADJUSTMENT

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. Loosen the range scale assembly mounting screws and the positioning link mounting screw just enough to make them friction tight. Position the range scale assembly so that the overtravel of the stop 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. Tighten the mounting screws and the positioning link screw.

* * *

ADDITION TO
BULLETIN 178, ISSUE 1
ADJUSTMENTS REPERFORATOR TRANSMITTER DISTRIBUTOR

Page 37

Insert the following immediately preceding the TAPE-OUT RELEASE and TAPE-OUT LEVERS ASSEMBLY ADJUSTMENTS:

NOTE

The following adjustment applies only to units equipped with the 110458 Tape Release Bracket Assembly as shown in Parts Bulletin 1126, Issue 1. Page 13 and should be made with the assembly removed.

TAPE-OUT LEVER GUIDE PLATE ADJUSTMENT

Position the guide plate by means of its mounting screws and elongated mounting holes so that the tape-out lever moves freely throughout its travel with a minimum amount of side play.

* * *

Teletype Corporation
Chicago, Illinois, U.S.A.

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CHANGES AND ADDITIONS TO BULLETINS

178, Issue 1, Adjustments - Reperforator Transmitter Distributor, Page 7
193, Issue 1, Adjustments - Reperforator Transmitter Distributor, Page 6
203, Issue 1, Adjustments - Reperforator Transmitter Distributor, Page 2-4

SELECTOR MAGNET BRACKET POSITION ADJUSTMENT

Change the clearance to read .058" to .065" instead of .060" to .065" and add the following note:

NOTE: The wider the clearance the more negative internal bias.
Values between .058" and .062" are usually the most favorable, especially at 75 speed.

* * *

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CHANGES IN ADJUSTMENT BULLETINS

164, Issue 1 - Tape Perforator, Page 5
147, Issue 2 - Nontyping Reperforator, Page 11
148, Issue 2 - Perforator Transmitter, Page 16
165, Issue 3 - Typing Reperforator, Page 2-14
166, Issue 2 - Perforator Transmitter, Page 18
171, Issue 2 - Typing Reperforator, Page 14
178, Issue 1 - Reperforator Transmitter Distributor, Page 25
193, Issue 1 - Reperforator Transmitter Distributor, Page 22
203, Issue 1 - Reperforator Transmitter Distributor, Page 2-15
167, Issue 1 - Tape Perforator, Page 6

Bulletins 178, 193, and 203 - PREPUNCH TAPE TENSION LEVER STUD ADJUSTMENT
Bulletins 147, 148, 165, 166, and 171 - TAPE TENSION LEVER STUD ADJUSTMENT

Change these adjustments to read as follows:

The tape tension lever stud should be centrally located with respect to the feed roll pins. This requirement should be measured as follows:

- (a) Take up the feed roll end play towards the star wheel and the tension lever end play towards its adjusting nut. The edge of the lever slot may touch the feed roll pins on the side of the pins nearest the ratchet but there must be clearance on the other side.
- (b) Take up the feed roll end play away from the star wheel and the tension lever end play away from the tension adjusting nut. The edge of the lever slot may touch the feed roll pins on the side farthest away from the ratchet but there must be clearance on the other side.

To adjust, add or remove shims between the shoulder on the tape tension lever stud and its mounting bracket.

Bulletins 164 and 167 - TAPE TENSION LEVER STUD ADJUSTMENT

Insert the above adjustment immediately before the TAPE TENSION LEVER SPRING TENSION ADJUSTMENT.

* * *

CHANGES AND ADDITIONS TO ADJUSTMENT BULLETINS

127B, Issue 3 - Type Bar Tape Printer (Model 14)
159B, Issue 2 - Type Wheel Page Printer (Model 26)
171B, Issue 2 - Typing Reperforator
178B, Issue 1 - Reperforator Transmitter Distributor
182B, Issue 1 - Multiplex Start-Stop Extensor Set
197B, Issue 1 - Multiple Reperforator Set
198B, Issue 1 - Type-Wheel Page Printer (Model 27)
199B, Issue 1 - Simplex-Diplex Converter
201B, Issue 1 - Sequential Control (SECO) System
203B, Issue 1 - Reperforator Transmitter (Model 14)
210B, Issue 1 - Sequential Selector
211B, Issue 2 - Multiple Reperforator Transmitter
220B, Issue 1 - Typing Reperforator (Model 14)

127B, Pages 8 and 14
159B, Page 6
171B, Page 8
178B, Page 9
182B, Page 17
197B, Page 16
198B, Page 18

199B, Page 2-5
201B, Page 5-5
203B, Page 2-5
210B, Page 2-7
211B, Page 2-6
220B, Page 2-4

ARMATURE TRIP-OFF ECCENTRIC SCREW ADJUSTMENT (pulling magnet); TRIP-OFF SCREW ADJUSTMENT (holding magnet)

Delete the present adjustment and substitute the following:

There should be some clearance, not more than .004" between the stop lever and the trip latch when the armature is in the unoperated position and the selector cam sleeve is rotated until the stopping edge of the stop lever is directly below the latching surface of the trip latch. While checking the above clearance, take up the play in the stop lever with a screwdriver applied axially adjacent to the spring hole as close to the bearing as possible with thrust in the direction of the trip latch. This clearance should be held to a minimum to favor the "at least .002" end play of the trip plunger.

The trip latch plunger should have at least .002" end play when the armature is held in the attracted position and when the stop lever is resting against its eccentric stop post.

To adjust, loosen the trip-off screw *(trip-off eccentric screw) lock nut and position the screw *(eccentric) to meet the first requirement. The latter requirement serves as a check on the trip-off screw *(trip-off eccentric) adjustment and also on the adjustment of the selector magnet bracket *(armature stops).

NOTE: Designations in parentheses marked with double asterisk (**) pertain to pulling magnet selectors.

*178B, Page 35
*203B, Page 2-22
*211B, Page 2-20

*DISTRIBUTOR (OR DISTRIBUTING) CONTACT ADJUSTMENTS

Substitute the following note for the present note just under the title of the adjustment:

NOTE: Contact points must be centrally aligned with each other and square (as gauged by eye) when the distributor contact levers are on the low part of their respective cams and the adjusting screws are set to permit the contacts to remain in closed position. Adjust by bending the long and short contact springs as necessary. The following adjustments are to be made with the distributor contact levers on the high part of their cams:

* * *

ADDITIONS TO BULLETINS

- 127, Issue 3, Adjustments - Model 14 Printer, Page 23
- 138, Issue 5, Adjustments - Typebar Page Printer (Model 15), Page 46
- 147, Issue 2, Adjustments - Non-Typing Reperforator, Page 8
- 155, Issue 1, Description and Adjustments - Start-Stop Regenerative Repeater, Page 9
- 159, Issue 2, Adjustments - Type Wheel Page Printer (Model 26), Page 29
- 160, Issue 1, Adjustments - Typebar Page Printer (Model 20), Page 34
- 165, Issue 3, Adjustments - Typing Reperforator (Model 14), Page 2-18
- 171, Issue 2, Adjustments - Typing Reperforator (Model 14), Page 21
- 178, Issue 1, Adjustments - Reperforator Transmitter (Model 14), Page 49
- 193, Issue 1, Adjustments - Model 14 Reperforator Transmitter, Page 35
- 201, Issue 1, Teletype Sequential Control (SECO) System, Page 5-8
- 203, Issue 1, Adjustments - Reperforator Transmitter (Model 14), Page 2-25
- 204, Issue 1, Description and Adjustments - Sequential Selector, Page 3-9
- *197, Issue 1, Adjustments - Multiple Reperforator Set, Page 24

1. This correction sheet supersedes EE-661 dated August, 1949, and applies to all bulletins listed above.

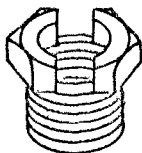
2. Add the information contained in paragraphs 3 and 4 below to the SELECTOR CLUTCH TORQUE requirement.

3. A more convenient method of regulating the selector clutch torque has been devised by the substitution of a 119540 keyed nut, a 122974 capstan nut, and a 122838 spacer for the 72515 nut and 72517 keyed nut on the main shaft. Where these new parts are present, the torque may be regulated by positioning the capstan nut in the proper direction with a screwdriver.

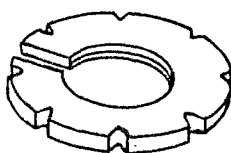
NOTE: The 122974 capstan nut is split and the open ends are offset to insure a tight fit on the 119540 slotted nut. To install the capstan nut the offset ends must be held approximately in line by using a pair of pliers or a clamp. The slotted nut can then be screwed into place. To regulate the selector torque the capstan nut may be positioned with a screwdriver. To prevent the capstan nut from being turned downward against the bearing, the 122838 spacer should be installed between the 119540 slotted nut and the bearing.

4. On units equipped with the 72515 nut and 72517 keyed nut, the selector clutch torque may be adjusted by the use of shims which may be placed between the clutch spring and the 72515 nut. The selector clutch spring must be removed from the shaft in order to apply the shims. Shims are available under the following numbers:

- 96763 Shim (.012" thick)
- 96764 Shim (.016" thick)
- 96765 Shim (.020" thick)



119540 NUT, KEYED



122974 NUT, CAPSTAN



122838 SPACER

CHANGES IN ADJUSTMENT BULLETINS

127, Issue 3 - Model 14 Type Bar Tape Printer, Page 3
138, Issue 5 - Model 15 Type Bar Page Printer, Page 11
147, Issue 2 - Single Magnet Reperforator, Page 7
160, Issue 1 - Model 20 Type Bar Page Printer, Page 9
165, Issue 3 - Model 14 Typing Reperforator, Page 2-2
171, Issue 2 - Model 14 Typing Reperforator, Page 3
178, Issue 1 - Model 14 Reperforator Transmitter, Page 4
193, Issue 1 - Model 14 Reperforator Transmitter, Page 2
197, Issue 1 - Multiple Reperforator Set, Page 10
203, Issue 1 - Model 14 Reperforator Transmitter, Page 2-1

In the bulletins listed above change the following adjustment to read as follows:

MAIN SHAFT CLUTCH THROWOUT LEVER ADJUSTMENT

With the motor operating, open and close the signal line and then stop the motor. There should be from .010" to .020" clearance between the teeth of the two clutch members. Adjust the clutch throw-out lever by means of its pilot screws to obtain this clearance. After adjusting, the lever should be free, with not more than .002" end play.

Bulletin 127, Page 25
Bulletin 165, Page 2-22

CONTACT BRACKET ADJUSTMENT

In this adjustment the requirement .010" to .020" should be changed to: some clearance not more than .010".

Change appropriate figure accordingly.

BULLETIN 127, Page 29
BULLETIN 165, Page 2-24

Bulletin 127 Tape Lever Spring Tension
Bulletin 165 Tape-Out Lever Spring Tension

Add the following note to these adjustments:

NOTE

The spring tension requirement on units equipped with the tape-out contact assembly should be 6 to 8 ozs.

* * *

ADDITION TO ADJUSTMENT BULLETINS

BULLETIN 127, ISSUE 3 - TYPE BAR TAPE PRINTER (MODEL 14), PAGE 21
BULLETIN 165, ISSUE 3 - TYPING REPERFORATOR (MODEL 14), PAGES 2-11, 2-12
BULLETIN 171, ISSUE 2 - TYPING REPERFORATOR, PAGE 11
BULLETIN 178, ISSUE 1 - REPERFORATOR TRANSMITTER DISTRIBUTOR, PAGES 15, 16
BULLETIN 193, ISSUE 1 - REPERFORATOR TRANSMITTER DISTRIBUTOR (MODEL 14),
PAGES 12, 13
BULLETIN 203, ISSUE 1 - REPERFORATOR TRANSMITTER DISTRIBUTOR (MODEL 14),
PAGE 2-8

1. On units equipped with the ribbon reverse arm yield spring the following adjustments replace the standard adjustments appearing in the above bulletins.

a. LEFT RIBBON REVERSE ARM SHAFT ADJUSTMENT (Figure 1)

(1) On typing units and typing reperforators there should be from .005" to .025" clearance between the rear of the left spool cup and the front end of the ribbon reverse shaft when the ribbon reverse shaft is held forward to make this clearance a minimum.

(2) On reperforator transmitters the left ribbon reverse shaft should be set flush with the front of the ribbon spool bracket.

(3) To adjust, loosen the set screw of the spring block, and if necessary, the set screws of the ribbon reverse shaft collar and link. Position the shaft while holding the ribbon reverse arm against the ribbon spool bracket and the spring block against the reverse arm. Tighten the spring block set screw.

b. RIBBON REVERSE ARMS SHAFTS COLLAR ADJUSTMENT (Figure 1)

Both right and left ribbon reverse arm shafts should have some end play, not more than .010". To adjust, position the collar on each shaft by means of its set screw. Locate the set screws so that they are easily accessible when the ribbon reverse arms are held up against the ribbon spool cups.

c. RIBBON REVERSE PAWL LINKS ADJUSTMENT (Figure 2)

The ribbon reverse bail should clear both left and right-hand ribbon reverse pawls by .015" to .040" when the ribbon reverse bail is opposite the reverse pawls and the ribbon reverse arms are against the spool cups. When checking the .015" clearance, the play in the ribbon reverse bail should be taken up in a direction to make the clearance a minimum. When checking the .040" clearance, the play in the ribbon reverse bail should be taken up in a direction to make the clearance a maximum. To adjust, position the spring block on the left ribbon reverse shaft and the sleeve on the right ribbon reverse shaft. The following adjustments should follow the Ribbon Reverse Pawl Links Adjustment.

d. RIBBON REVERSE ARM YIELD SPRING TENSION ADJUSTMENT (Figure 2)

Position the ribbon reverse bail so that it will block the full travel of the ribbon reverse arm, and with the ribbon reverse pawl resting against the ribbon reverse bail, apply the push end of an 8 oz. scale, held at a right angle to the ribbon reverse arm at the center where the ribbon is threaded. It should require $1\frac{1}{2}$ to $4\frac{1}{2}$ ozs. to start the ribbon reverse arm moving. If it is necessary to increase or decrease the tension, remove the spring and adjust by bending.

2. The Stripper Spring Requirement has been added to the following bulletins and should precede the CODE PUNCH-BLOCK FEED-ROLL SHIMS ADJUSTMENT.

BULLETIN 193, PAGE 19
BULLETIN 203, PAGE 2-13

STRIPPER SPRING REQUIREMENT

Remove the punch block from the unit. (Refer to next adjustment for removal of punch block). With an 8 oz. scale hooked under the shoulder of the stripper pins, pull in a horizontal direction. It should require at least 4 ozs. to start the punch stripper pins moving by compressing the springs.

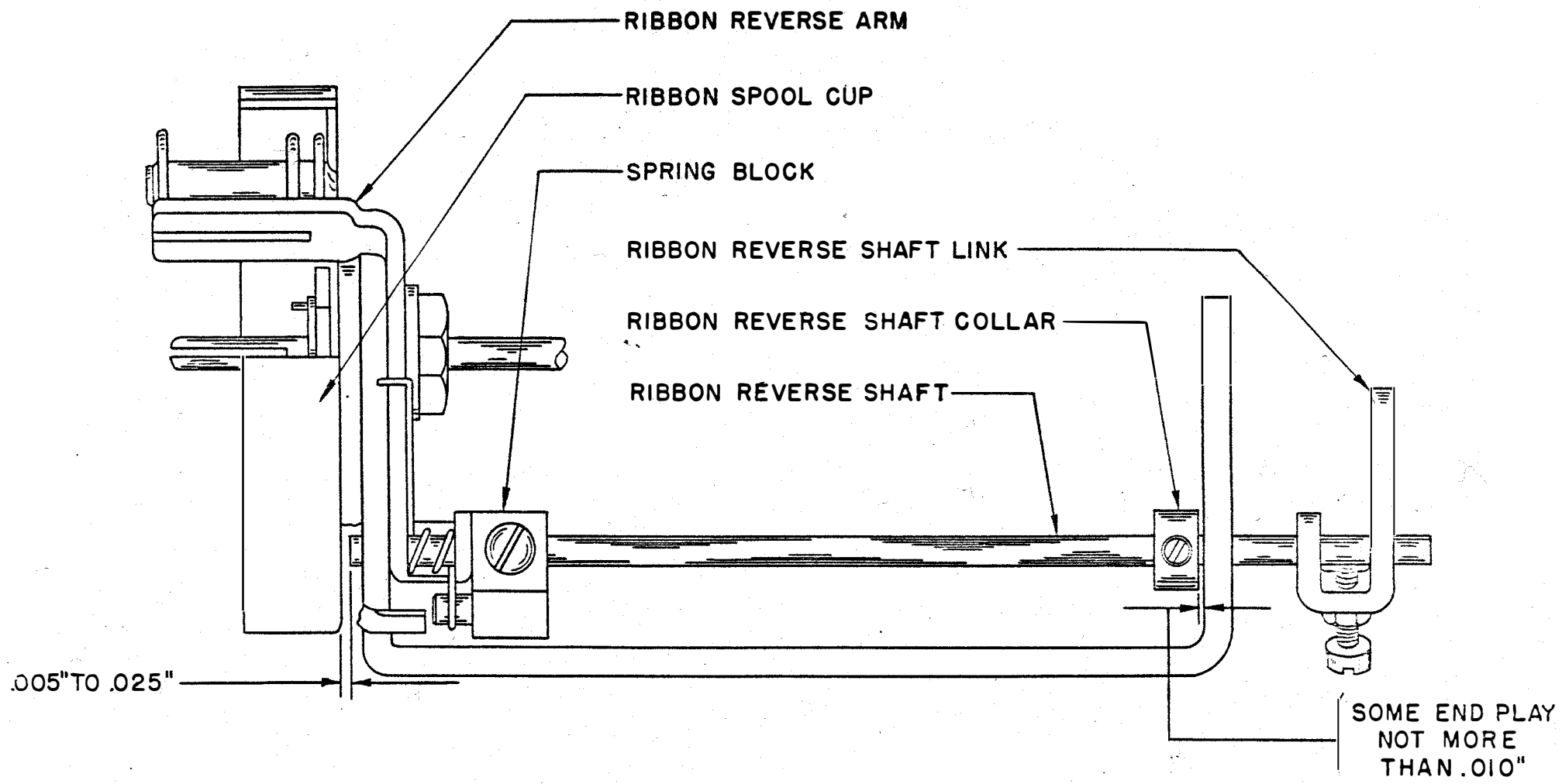


FIGURE 1

POSITION OF RIBBON REVERSE
BAIL WHEN TAKING RIBBON REVERSE
ARM YIELD SPRING TENSION

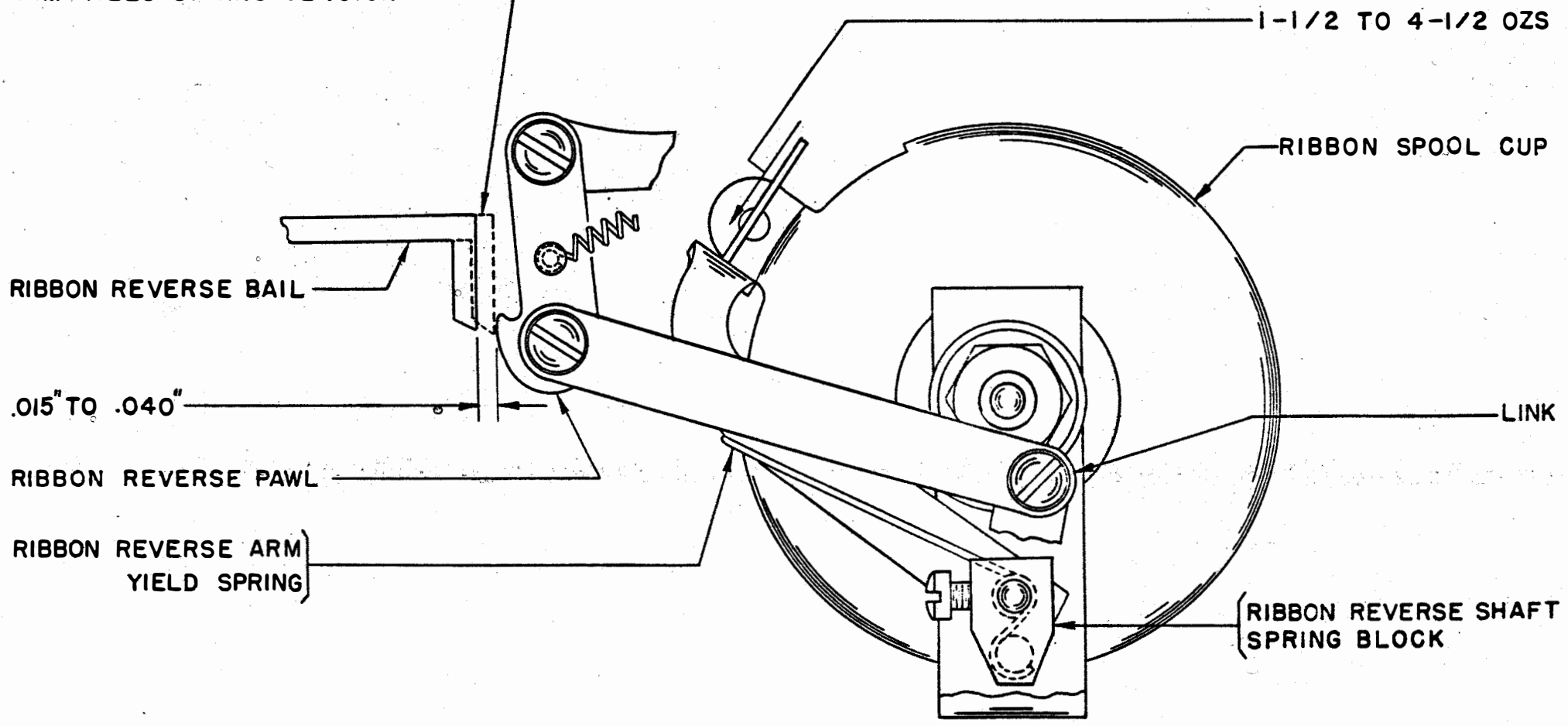


FIGURE 2

CHANGES AND ADDITIONS
TO BULLETINS 178B, (Issue 1), and 203B, (Issue 1)

ADJUSTMENTS, MODEL 14 REPERFORATOR TRANSMITTER (FRXD)

178B, Page 41
203B, Page 2-25

Add the following adjustments to 178B, and to the Switching-Control Contact Assembly Adjustments in 203B.

Refer to Figure 1 for position and number of contacts which apply in the following adjustments for FRXD15.

1. The heavy contact springs with tangs are Nos. 1, 3, 4, 6, 7, 9, 10, and 12. The tangs of these springs should be in alignment with the main body of the spring before starting adjustments.

These springs should register 30 to 50 gms. just as the tang of the spring leaves the comb.

NOTE: In tensioning spring Nos. 3, 6, 9, and 12, the load of the opposings springs should be removed by pressing the right hand stud to the left.

2. Spring No. 2 should register 18 to 25 gms. just as it breaks contact with the opposing spring.

NOTE: There should be some clearance between the No. 2 spring and the stud of No. 5 spring.

3. Spring No. 5 should register 18 to 25 gms. just as it breaks contact with the No. 6 spring, and there should be some clearance, not more than .003", between the stud of the No. 5 spring, and the No. 2 spring.

To adjust, bend and bow No. 5 spring. If further refinements are necessary the tang on No. 6 spring may be bent slightly.

NOTE: In making this adjustment, some clearance should be maintained between the No. 8 spring and the stud of No. 5 spring. Hold No. 8 spring away by hand.

4. Spring No. 11 should register 18 to 25 gms. just as it breaks contact with the No. 12 spring, and there should be some clearance, not more than .003", between the stud of the No. 11 spring and the No. 8 spring.

To adjust, bend and bow No. 11 spring. If further refinements are necessary the tang on No. 12 spring may be bent slightly.

NOTE: In making this adjustment, some clearance should be maintained between the No. 8 spring and the stud on No. 11 spring. Hold No. 8 spring away by hand.

5. Spring No. 8 should register 18 to 25 gms. just as it breaks contact with the No. 9 spring, and there should be some clearance, not more than .003", between the stud of the No. 5 spring and the No. 8 spring.

To adjust, bend and bow No. 8 spring. If further refinements are necessary, the tang on No. 9 spring may be bent slightly.

NOTE: Install the switching control contact assemblies on the base casting taking care to align the studs with the associated eccentrics on the contact bails.

CONTACT PILE-UP ALIGNMENT

1. With the slide levers in the spacing (lower) position and the slots in all the contact bail eccentrics in a vertical position (high side up or down according to the position that gives the fullest engagement between the end of the plunger and the curvature of the eccentric) the gap between the No. 1 and No. 5 eccentrics and their associated studs should be .010" to .015". To adjust, loosen the two eccentric stop mounting screws and rotate the eccentrics away from the brackets. Loosen the contact bracket mounting screws and position the bracket. Tighten the mounting screws. Rotate the eccentrics so they make contact with the bracket and tighten the screws which mount the eccentrics.

2. Adjust the clearance on the remaining three individual contact pile-ups so that the clearances are from .010" to .015". To adjust, position the eccentrics.

3. With the slide levers in their lower (spacing) position, adjacent contact springs No. 1 and 2, 4 and 5, 7 and 8, 10 and 11, should "make" with a .035" gauge, and "not make" with a .030" gauge placed between the slide lever eccentrics and their respective studs.

To adjust, bend tangs on spring Nos. 1, 4, 7, and 10 and recheck tension requirements in paragraph (A) under Spring Tension Adjustments.

Refer to Figure 2 of this correction sheet for position and number of contacts which apply in the following adjustments for FRXD12; Refer to Bulletin 178 for Figure 72 when listed.

SWITCHING-CONTROL CONTACT BRACKET AND BOOSTER SPRINGS PRELIMINARY

The tang of each booster spring should be in line with the edge of the spring.

Bend the tang of the No. 3 contact spring so that when No. 2 contact spring rests against No. 3, there is approximately .050" between Nos. 1 and 2 contacts spring points.

With the slide levers in the SPACING (lower) position and the slots in all the contact bail eccentrics in a vertical position (high side up or down according to the position that gives the fullest engagement between the end of the plunger and the curvature of the eccentric) the gap between the booster springs (of pile-ups No. 1 and No. 5) and their studs should be .050"

to .060". To adjust, loosen the two eccentric stop mounting screws and rotate the eccentrics away from the brackets. Loosen the contact bracket mounting screws and position the bracket. Tighten the mounting screws. Rotate the eccentrics so they make contact with the bracket and tighten the screws which mount the eccentrics.

Bend the tangs of the booster springs until there is a clearance of .030" to .040" between the booster springs and their associated studs.

SWITCH-CONTROL CONTACT BRACKET AND BOOSTER SPRINGS FINAL (Figure 72)

With the slide levers in their SPACING (lower) position, the gap between the booster springs and their studs should be .030" to .035". To adjust, position the contact bail eccentrics.

SWITCH-CONTROL CONTACT BOOSTER SPRING TENSION (Figure 72)

With the slide levers in their SPACING (lower) position, hook an 8 oz. scale on the end of each booster spring and pull at right angle to the spring. It should require 6-1/2 to 7-1/2 ozs. to just move the tangs of the booster spring away from its associated bakelite barrier of the comb. To adjust, bend the booster spring.

SWITCHING CONTACT GAP

With the slide levers in their SPACING (lower) position, the contacts should MAKE when a .035" gauge is placed between the contact bail eccentrics, and their associated studs.

With the slide levers in their SPACING (lower) position, the contacts remain open when a .030" gauge is placed between the contact bail eccentrics and their associated studs. To adjust, bend the tangs on the No. 1 contact springs.

SWITCHING CONTACTS CONTACT SPRING TENSION (Figure 72)

With the sliding levers in their SPACING (lower) position, place a gram scale to the end of each No. 1 contact spring. It should require 30 to 50 grams to just move the tang away from its associated barrier. To adjust, bend the No. 1 contact springs.

With the sliding levers in their SPACING (lower) position there should be from .015" to .025" clearance between the No. 1 and No. 2 contact spring points. Adjust by bending the tang on No. 3 spring. Check to see that there is at least .005" clearance between the spring studs and eccentrics.

With the sliding levers in their MARKING (upper) position, place a gram scale to the end of each No. 3 contact spring. It should require 30 to 50 grams to just move the tang from its associated barrier. To adjust, bend the No. 3 contact springs.

SWITCHING-CONTROL BIFURCATED (SPLIT) CONTACT SPRING TENSION (Figure 72)

With the sliding levers in their SPACING (lower) position, place a gram scale on the end of each side of the bifurcated contact spring (No. 2). It should require 18 to 25 grams to just break contact with the No. 3 contact spring. To adjust, bend the bifurcated contact spring.

178B, Page 40
203B, Page 2-24

The following adjustments apply to all reperforator transmitter units equipped with the adjustable detent mechanism (Figure 3) for the sensing and distributing cam sleeves and should be included immediately after the CLUTCH THROW-OUT LEVER SPRING TENSION.

a. DETENT LEVER

The detent levers should engage their respective cams by at least $2/3$ the width of the cams when the play in the detent levers is taken up in a direction to make this engagement a minimum. Position the detent bracket to meet this requirement.

b. DETENT LEVER PLATE

With both clutches in their fully disengaged positions there should be a maximum and approximately equal amount of engagement (for both levers) between the detent levers and their respective cams. To adjust, position the detent lever plate on its bracket by means of the elongated mounting holes. Make certain that both spring tensions are approximately equal by extending the springs and equal amount. Gauge by eye. If the detent bracket had been repositioned for alignment of the detent levers with their cams, the tape-out contact adjustment must be rechecked and, if necessary, remade.

c. DETENT LEVER SPRING TENSION

With the detent levers resting on the high part of their cam, apply a 32 oz. scale to the cam end of the lever and pull at right angle, (as nearly as possible) to the levers. It shall require from 6 to 9 ozs. to start the levers moving away from their cams.

LUBRICATION

- a. Both loops of the detent lever springs - oil (4)
- b. Clutch detent levers - oil bearings (2)
- c. Clutch detent levers - grease engaging surface with cam (2)
- d. Detent cams - thin film of grease (2)
- e. Lubricators - saturate with oil (2)

178B, Page 45, Paragraph (2)

Contact Spring Tension

Change the requirement "30 to 35 grams" to read: 30 to 50 grams.

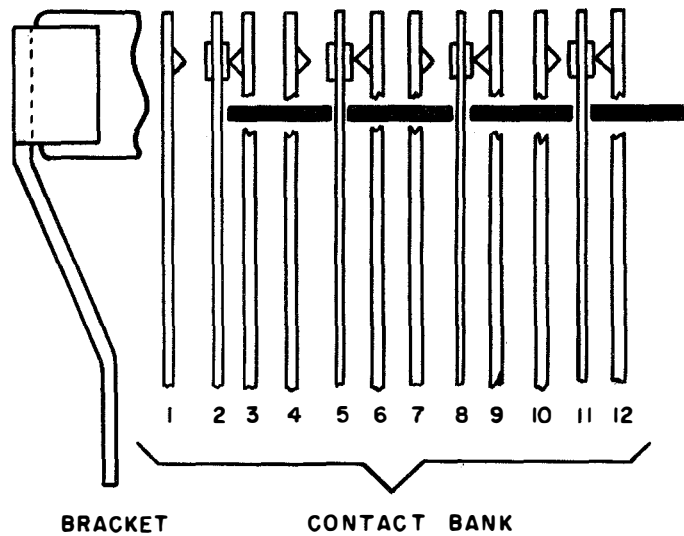


FIGURE 1

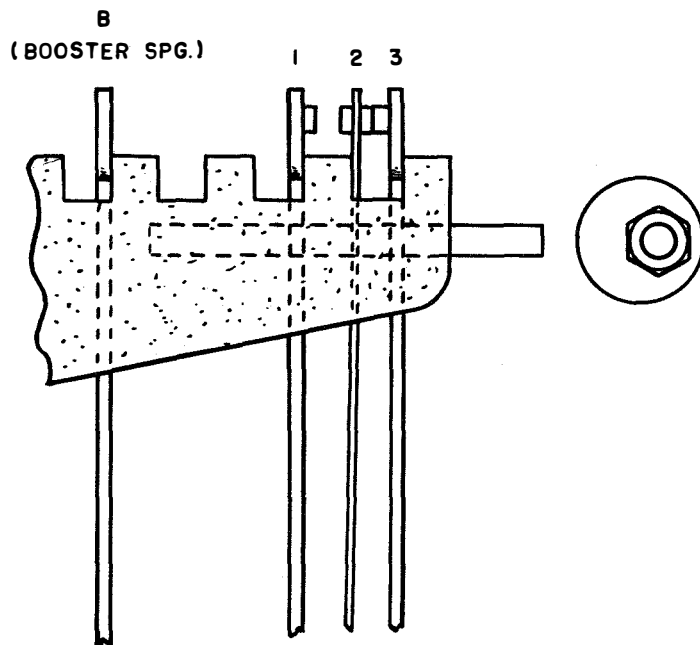


FIGURE 2

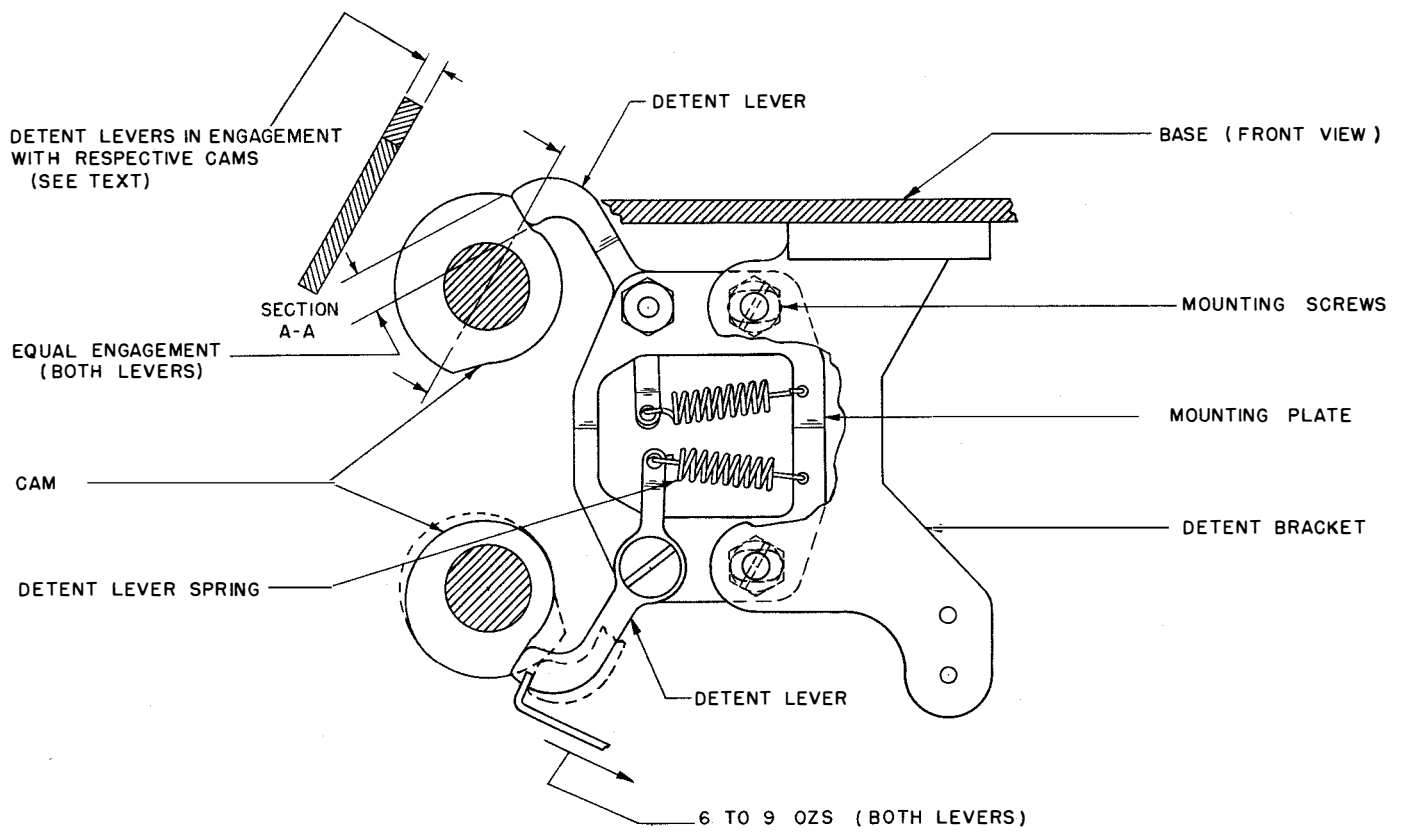


FIGURE 3

CHANGES AND ADDITIONS
TYPING REPERFORATOR TRANSMITTER DISTRIBUTOR
ADJUSTMENT BULLETIN 178B, ISSUE 1
TO
INCLUDE THE FRXD16 FOR CONTROLLING
THE TRANSMITTED SIGNAL FROM AN EXTERNAL START SIGNAL

Page 35

DISTRIBUTOR CONTACT ADJUSTMENTS (Figure 61)

To the "NOTE", immediately after "cams", add the following: The rear contact is used as a transmitter clutch contact on the FRXD 16.

Page 36

Add the following after subparagraph (4):

DISTRIBUTOR CONTROL CONTACT ADJUSTMENTS (Figure 62)

This adjustment applies to the FRXD16. Make the adjustments as directed above under "AUXILIARY CONTACT ADJUSTMENT".

Page 37

Add the following after subparagraph (5):

SYNCHRONIZING PULSE CONTACT ADJUSTMENT (Figure 63)

This adjustment applies to the FRXD16. Make the adjustment as directed above under "DISTRIBUTOR CLUTCH RELEASE CONTACT ADJUSTMENT".

Page 39

Add the following before "DISTRIBUTOR SHAFT CLUTCH THROWOUT LEVER SPRING TENSION":

DISTRIBUTOR START CONTACT ADJUSTMENTS FOR FRXD16 ONLY (Figure 67.1)

NOTE: Before making any of the following adjustments, be sure that the contact points are centrally aligned with each other.

- (1) With the distributor clutch throwout lever resting on the high part of the driven clutch and the contact bracket positioned to provide maximum clearance between the bakelite tip of the long contact spring and the magnet armature, hook the pull end of an 8 oz. scale on the end of the short contact spring and pull approximately at right angle to the contact spring. It should require 1/2 to 1-1/2 ozs. to just separate the contact points on the contact springs. To adjust, bend the short contact spring.

- (2) With the distributor clutch throwout lever resting on the low part of the driven clutch and the bakelite tip of the long contact spring resting against the armature, there should be .015" to .030" gap between the contact points. With the distributor clutch throwout lever resting on the high part of the driven clutch, there should be at least .003" clearance between the magnet armature and the bakelite tip of the long contact spring. To adjust, loosen the contact bracket mounting screws and position the bracket.
- (3) With the distributor clutch throwout lever resting on the low part of the driven clutch and the bakelite tip of the long contact spring resting against the magnet armature, apply the push end of an 8 oz. scale to the long contact spring at the contact point and push approximately at right angle to the contact spring. It should require 1-1/2 to 2-1/2 ozs. to start the bakelite tip on the long contact spring moving away from the armature. To adjust, bend the long contact spring.
- (4) Recheck adjustments No. (1) and No. (2).

*Page 53

Add the following subparagraph after subparagraph (9):

(11) Distributor start contact - thin film of grease on bakelite tip at point of contact with armature

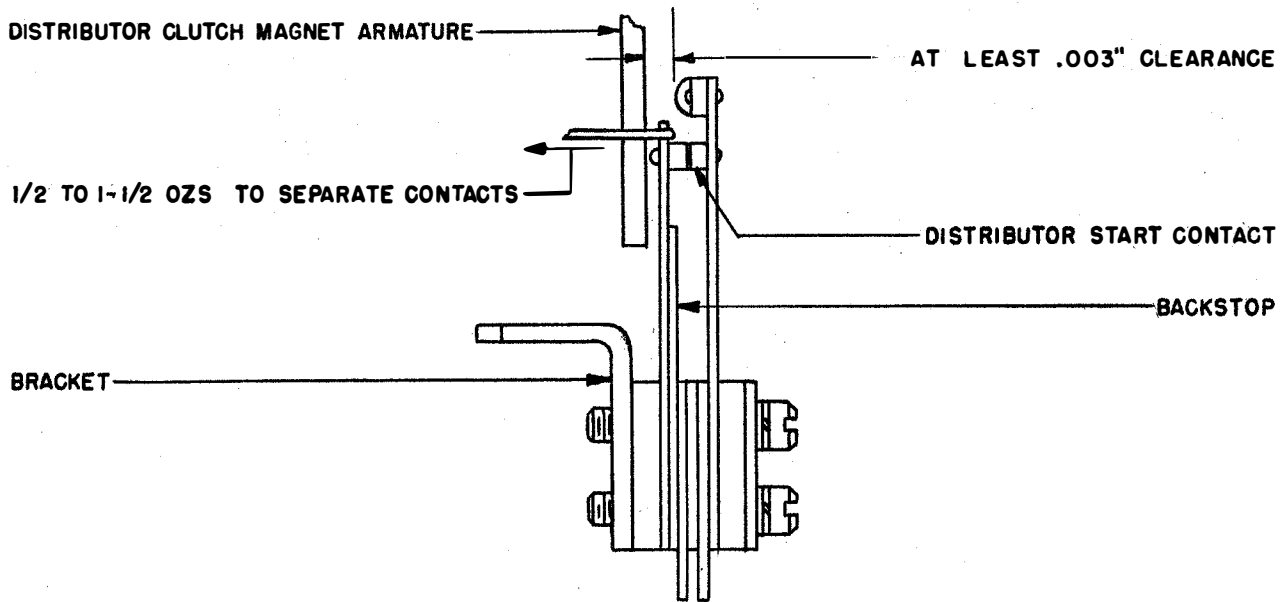
Figure 67.1

Add Figure 67.1 immediately after Figure 67.

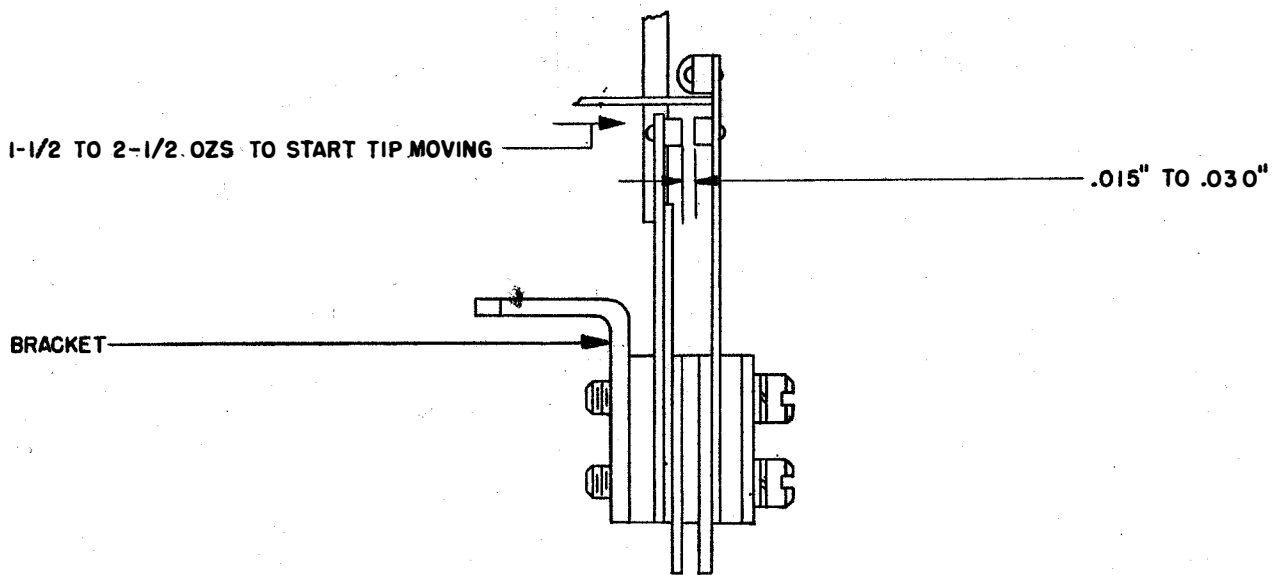
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A



B

FIGURE 67-1

CHANGES AND ADDITIONS
TO BULLETINS 178B (ISSUE 1) and 203B (ISSUE 1),
MODEL 14 REPERFORATOR TRANSMITTER
(FRXD)

*178B, Page 21
*203B, Page 2-13

*Add the following NOTE after the MAIN BAIL ADJUSTING SCREW
FINAL ADJUSTMENT:

NOTE: If it is necessary to change this adjustment or any
related adjustment, the following adjustments should be checked and remade,
if necessary, in the order given:

	178B Page No.	203B Par. No.
a. MAIN BAIL ROLLER GUIDE	10 or 12	(5)
b. PULL BAR GUIDE	10 or 13	(6)
c. MAIN BAIL ADJUSTING SCREW (PRELIMINARY)	10 or 13	(7)
d. CODE BAR BELL CRANKS	21	(47)
e. VERTICAL LINK PIVOT SCREW	21	(49)
f. VERTICAL LINK LOWER BELL CRANK SEPARATOR PLATE	664EE	664EE
g. CODE BAR LOCKING LEVER SPRING TENSION	18	(28)
h. MAIN BAIL SPRING TENSION (FINAL)	48	(125)
i. MAIN BAIL ADJUSTING SCREW (FINAL)	21	(48)

178B, Page 26, PREPUNCH FEED ROLL DETENT FINAL ADJUSTMENT (Figure 46)
203B, Page 2-14, Par. (53), CODE-PUNCH FEED-ROLL DETENT PRELIMINARY ADJUST-
MENT (Figure 44)
203B, Page 2-16, Par. (69), PREPUNCH FEED-ROLL DETENT FINAL ADJUSTMENT

The 2215 Tape Gauge has been replaced by the 95960 Tape Gauge.

*178B, Page 29
*203B, Page 2-17

*Add the following adjustment after the CODE PUNCH TAPE GUIDE
ADJUSTMENT:

PLATEN HEIGHT ADJUSTMENT

With the tape inserted in the unit (from the prepunch through the
tape guide and into the code punch), adjust the platen height, by means of shims
in the platen support, so that the clearance between the platen and the tape is a
minimum and so that the platen does not hang up on the rear edge of the tape
when the shift mechanism returns from its rear-most position to which it
may be moved manually after disengaging the shift lever from the platen frame.

178B, Page 30, Par. (1), TAPE RETAINING LID LATCH ADJUSTMENT (Figure 51)
203B, Page 2-18, Par. (a), TAPE RETAINING LID LATCH ADJUSTMENT (Figure 54)

Change the tape retaining lid latch spring tension requirement to read $3/4$ to $1-1/2$ oz. instead of $3/4$ to 1 oz.

178B, Page 40, TAPE REEL TAPE-OUT CONTACT LEVER ADJUSTMENT (Figure 69)

Change Paragraph 1 to read as follows:

With the tape reel tape-out contact lever resting against the side of the tape reel container, adjust the lever by bending so that it touches or is within .050" of touching the inside radius of the container for a length of $3-1/2$ " from the end of the lever.

*178B, Page 40, Par. (3), TAPE REEL TAPE-OUT CONTACTS ADJUSTMENT (Figure 69)

*Change the requirement to read .015" to .030" instead of .015" to .020".

*203B, Page 2-23, Par. (119a), TAPE-OUT CONTACT ADJUSTMENT (Figure 70)

*Change this paragraph to read as follows:

With the tape-out sensing pin in its uppermost position and with the tape-out contact swinger held away from the lever extension, hold the Pivoted transmitter in its vertical position and apply an 8 oz. push scale to the tape-out sensing pin. It should require $2-3/4$ to $4-1/4$ ozs. to start the tape-out lever moving (this may be easily determined by observing the lever spring). In order to eliminate friction between the tape feed lever and the tape-out lever, the tape feed lever should be positioned toward the rear of the unit, when measuring the spring tension.

*203B, Page 2-24, Par. (121a4), UNIVERSAL CONTACT ADJUSTMENT (Figure 73)

*Change the requirement to read .010" to .020" instead of .010" to .015".

*203B, Page 2-27, Par. (129c), TAPE-FEED-INDICATOR CONTACT ASSEMBLY ADJUSTMENT (Figure 79)

*Change the requirement to read .005" to .025" instead of .010" to .020".

Change applicable Figures accordingly.

CHANGES AND ADDITIONS TO ADJUSTMENT BULLETINS

- 127B, Issue 3 - Type Bar Page Printer (Model 14), Page 7, 10
- 138B, Issue 5 - Type Bar Page Printer (Model 15), Pages 19, 23
- 159B, Issue 2 - Type Wheel Page Printer (Model 26), Page 3
- 171B, Issue 2 - Typing Reperforator, Page 7
- 178B, Issue 1 - Reperforator Transmitter Distributor, Page 6
- 182B, Issue 1 - Multiplex Start-Stop Extensor Set, Page 14
- 197B, Issue 1 - Multiple Reperforator Set, Page 13
- 198B, Issue 1 - Type-Wheel Page Printer (Model 27), Page 15
- 199B, Issue 1 - Simplex-Duplex Converter, Page 2-2
- 201B, Issue 1 - Sequential Control (SECO) System, Page 5-3
- 203B, Issue 1 - Reperforator Transmitter (Model 14), Page 2-3
- 210B, Issue 1 - Sequential Selector, Page 2-4
- 211B, Issue 2 - Multiple Reperforator Transmitter, Page 2-3

(ARMATURE) LOCKING WEDGE

Change the requirement of the present adjustment as follows: (Bulletins and affected pages are listed above).

For pulling magnet selectors, from ".008" to ".012" to read: ".006" to ".012".

For holding magnet selectors, from ".006" to ".010" to read: ".005" to ".012".

Change applicable figure accordingly.

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