BULLETIN NO. 6
ISSUE 2
JANUARY, 1938

TELETYPESETTER

ADJUSTMENTS
OPERATING UNIT

TELETYPESETTER
CORPORATION
1400 WRIGHTWOOD AVE.,
CHICAGO, U.S.A.

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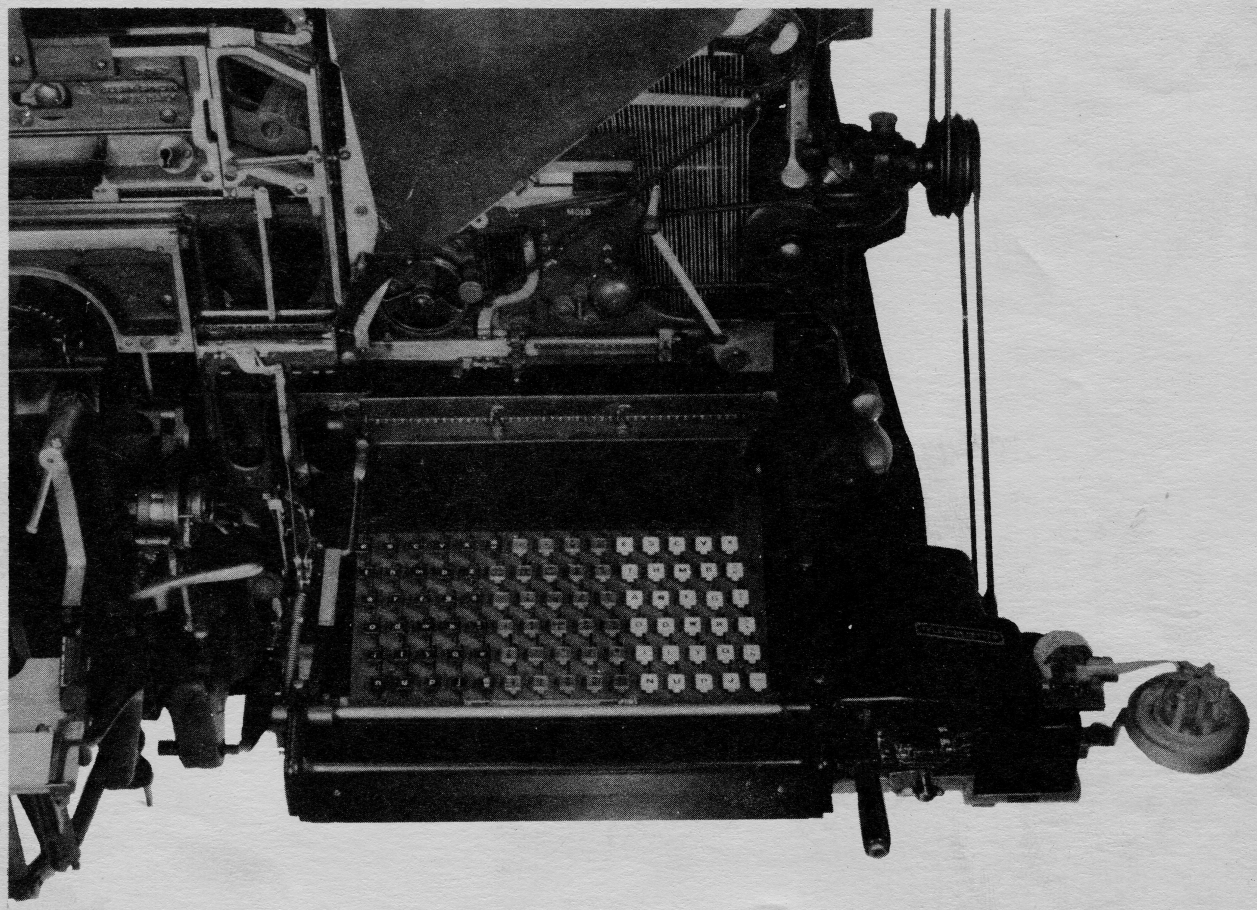
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ADJUSTMENTS
OPERATING UNIT

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CORPORATION
1400 WRIGHTWOOD AVE.,
CHICAGO, U.S.A.

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TELETYPESETTER OPERATING UNIT

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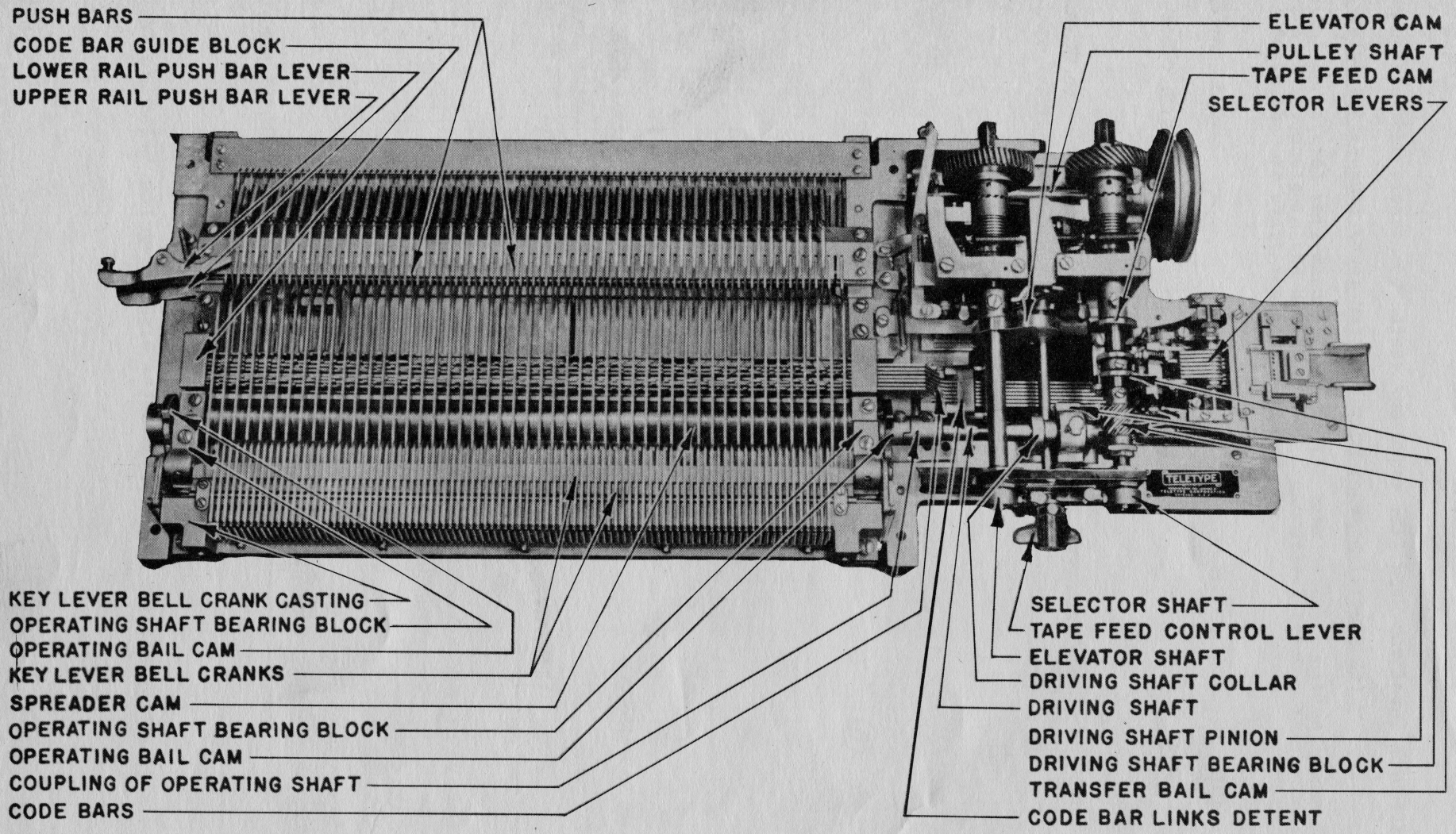


ILLUSTRATION A
OPERATING UNIT
(COVERS AND HANGERS REMOVED)

ADJUSTMENTS - TELETYPESETTER OPERATING UNIT

The following adjustments are arranged in a sequence that would be followed if a complete readjustment of the operating unit were undertaken. This fact should be kept in mind when a single adjustment is to be made.

The spring tension values given in this bulletin were derived from measurements made with Teletypesetter spring scales. These spring scales are calibrated for use in a vertical "pull" position. When used in any other position, the reading is an indicated value. Therefore, in order to obtain the proper spring value readings, the spring scales which are included in the Teletypesetter catalog tool list should be used.

NOTE: In all the figures of this bulletin, fixed pivot points are designated by solid black circles.

BEFORE PROCEEDING WITH THE ADJUSTMENTS, IT WILL BE NECESSARY TO REMOVE THE OPERATING UNIT FROM THE SLUG LINE CASTING MACHINE. PROCEED AS FOLLOWS:

Remove the driving belt.

Remove the three covers from the operating unit.

Back off the knurled clamping screw mounted on the keyboard base casting.

Remove the two hanger pilot screws.

Remove the operating unit from the slug line casting machine.

Remove the screw from the coupling sleeve on the drive shaft and move the sleeve out of engagement with the right operating bail cam. (See Figure 1 for location of parts.)

Remove the two hangers (used to mount the operating unit on the slug line casting machine) by removing the two screws which mount each hanger to the base.

Remove the four screws which mount the push bar assembly to the base casting and remove the push bar assembly.

Remove the two screws which mount the key lever bell crank assembly to the push bar assembly and remove the key lever bell crank assembly. While doing this, make note of the number of shims beneath each end of the casting, so that the same number may be replaced when the unit is reassembled.

Key Lever Bell Crank Spring Tension (Figure 2)

Hook an 8 oz. scale over each bell crank just above the backstop and pull at right angles to the bell crank. It should require 4 to 6 ozs. to start the bell crank moving.

Code Bar Guides Adjustment - See Note (A)

Rotate the spreader cam until the push bars are moved away from the code bars. The code bars should move freely in the code bar guide slots and should drop of their own weight when the assembly is held in a vertical position.

To adjust, position the code bar guides to meet this requirement.

(A) This requirement should be checked with the push bar assembly removed.

NOTE: After making a single adjustment, check related adjustments.

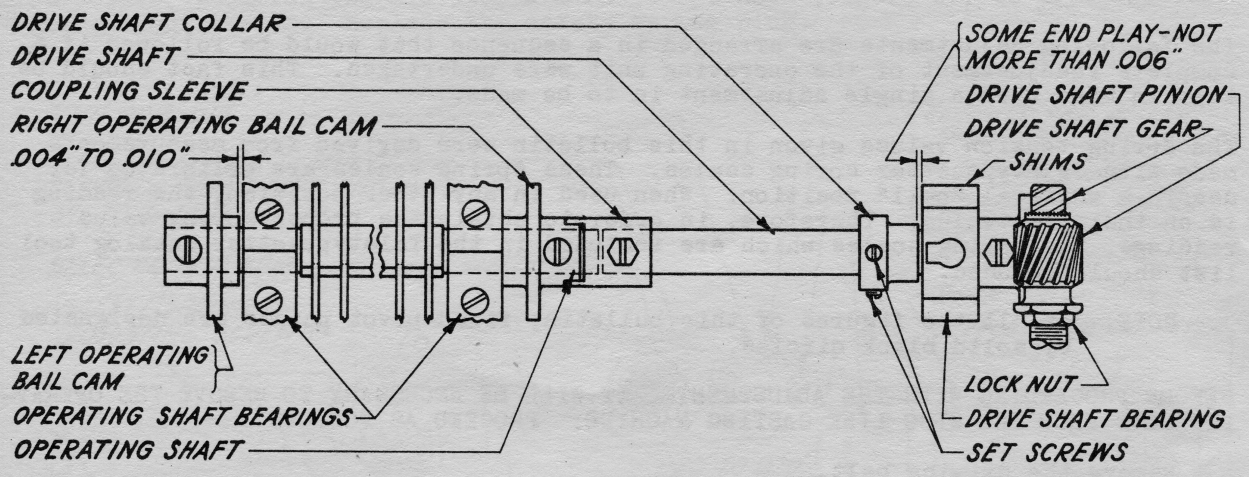


FIGURE 1

Push Bar Spring Tension (Figure 2) - See Note (B)

Rotate the spreader cam until the high parts of the cam are horizontal. Hook a 32 oz. scale in a push bar notch and pull in line with the push bar. It should require 8 to 11 ozs. to start each lower push bar moving and 6 to 9 ozs. to start each upper push bar moving.

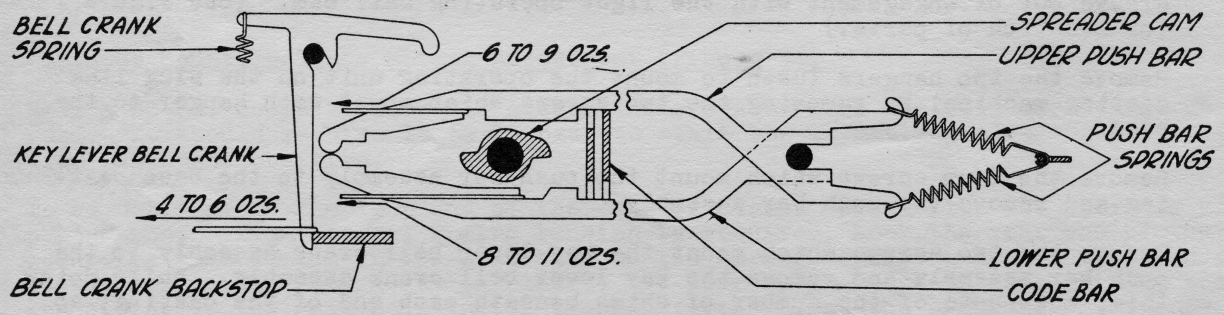


FIGURE 2

Operating Shaft Bearings Adjustment (Figure 1)

Unhook both operating bail lever springs (Figure 3) from the operating bail levers. The operating shaft should rotate through a complete revolution without binding and should have .004" to .010" end play. The first requirement may be met by positioning the bearings at each end of the operating shaft. Position the left operating bail cam to meet the second requirement.

Operating Bail Lever Spring Tension (Figure 3)

With the operating bail cam rollers on the low part of the operating bail cams, hook a 12 lb. scale in each spring eye. It should require 2 to 2-1/2 lbs. to stretch each spring to position length.

REPLACE BOTH SPRINGS.

Shift Lever Spring Tension (Figure 4) - See Note (C)

Unhook the shift lever spring from its post and hook a 12 lb. scale in the spring eye. With the shift lever engaged by the shift latch, it should require 2 to 3 lbs.

(B) This requirement should be checked with the key lever bell crank assembly removed.

NOTE: After making a single adjustment, check related adjustments.

to stretch the spring to position length.

Yield Lever Spring Tension (Figure 4) - See Note (C)

Unhook one end of the yield lever spring and hook a 12 lb. scale in the spring eye. With the shift lever engaged by the shift latch, it should require 1-1/2 to 2-1/2 lbs. to stretch the spring to position length.

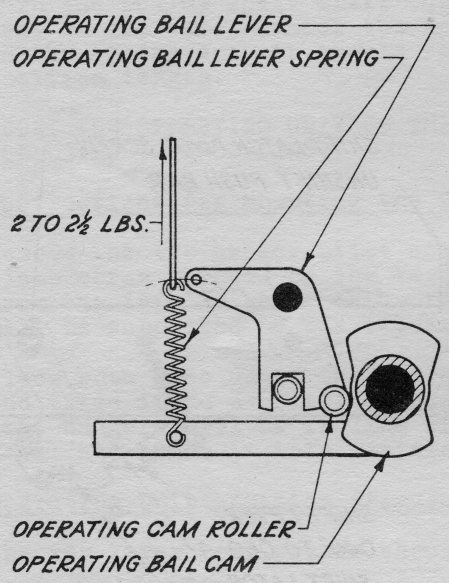


FIGURE 3

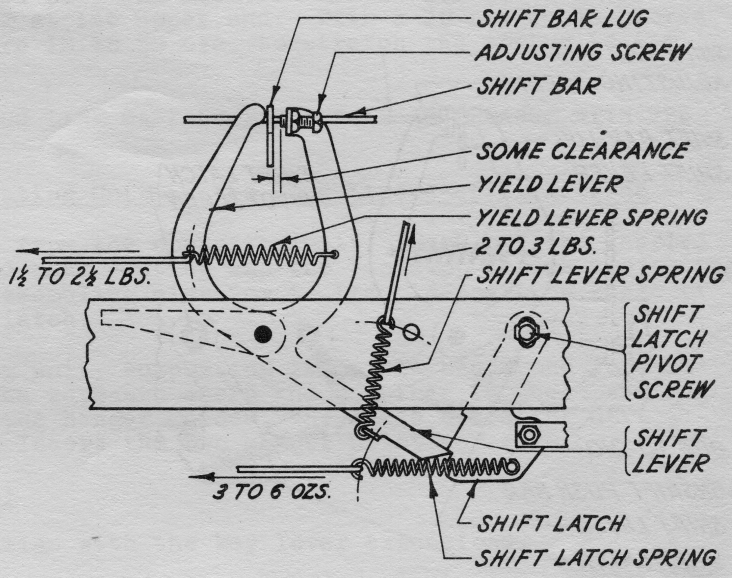


FIGURE 4

Shift Latch Spring Tension (Figure 4) - See Note (C)

Unhook the shift latch spring from the shift lever and hook an 8 oz. scale in the spring eye. With the shift lever engaged by the shift latch, it should require 3 to 6 ozs. to stretch the spring to position length.

Shift Lever Adjusting Screw Adjustment (Figure 5) - See Note (C)

With the push bars on the high parts of the spreader cam and the shift lever in its unlatched position, move the shift bar to the "shift" position (extreme left). There should be .004" to .010" clearance between the shift lever and the projection on the unshift push bar.

To obtain this clearance, adjust the shift lever adjusting screw.

Shift Latch Adjustment (Figure 6) - See Note (C)

Rotate the spreader cam until the push bars are moved away from the code bars. Set up the unshift combination by moving the zero code bar to the right and the numbers 1, 2, 3, 4, and 5 code bars to the left. Rotate the operating shaft until the unshift push bar is selected and moved to its extreme forward position by the operating bail. There should be .040" to .060" clearance between the shift lever and the shoulder of the latch.

To obtain this clearance, position the shift latch pivot screw.

NOTE: With the shift lever in the latched position and the shift bar in the unshift position (extreme right), there should be some clearance between the shift bar lug and the shift lever adjusting screw as shown in Figure 4.

(C) This requirement may be checked with the left base plate removed.

NOTE: After making a single adjustment, check related adjustments.

If there is no clearance, the shift lever adjusting screw and the shift latch should be readjusted.

Upper and Lower Rail Push Bar Lever Spring Tension (Figure 7)

With the push bars in the unoperated position, hook an 8 oz. scale over the end of the rail push bar lever and pull at right angles to the lever. It should require 3-1/2 to 5-1/2 ozs. to start each lever moving.

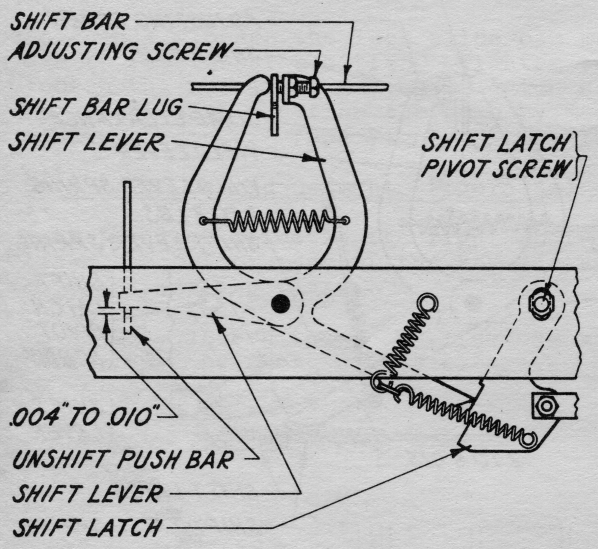


FIGURE 5

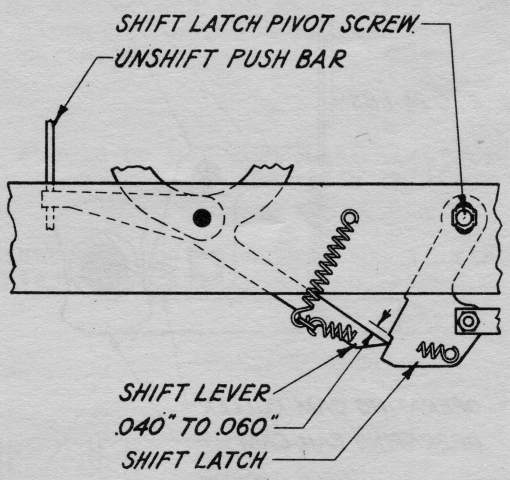


FIGURE 6

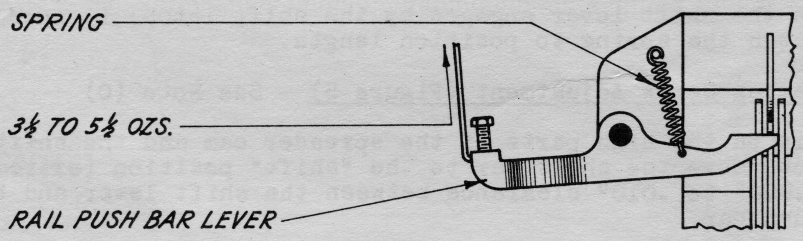


FIGURE 7

REPLACE THE KEY LEVER BELL CRANK ASSEMBLY ON THE PUSH BAR ASSEMBLY AND MOUNT THE ENTIRE PUSH BAR ASSEMBLY ON THE BASE CASTING. REMOVE THE SELECTING ASSEMBLY IN ACCORDANCE WITH THE FOLLOWING INSTRUCTIONS:

Instructions for Removing the Selecting Assembly

Remove the three selecting assembly mounting screws. Remove the front guide rail. Rotate the spreader cam until the push bars are moved away from the code bars and move the code bars to their operated (extreme left) position. Manually raise the transfer bail as high as possible. While holding the transfer bail in this position, raise the selecting assembly until the selecting assembly base plate

---

NOTE: After making a single adjustment, check related adjustments.

mounting screws clear the operating unit casting. Move the selecting assembly to the right and remove it from the operating unit.

Code Bar Links Guides Adjustment - See Note (D)

Rotate the spreader cam until the push bars are held away from the code bars. With the code bar links detent and the delay control bail held away from the links, the code bars and the code bar links should drop of their own weight when the unit is held so as to bring the bars and links to a vertical position.

To meet this requirement, position the code bar link guides. (See Figure 24 for location of parts.)

REPLACE THE LEFT HANGER.

Key Lever Bell Crank Stop Adjustment (Figure 8)

With the push bars on the high parts of the spreader cam, there should be .004" to .030" clearance between the ends of the push bars and their corresponding key lever bell cranks.

To obtain this clearance, loosen the bell crank mounting screws and adjust by means of the two adjusting screws. Tighten the mounting screws.

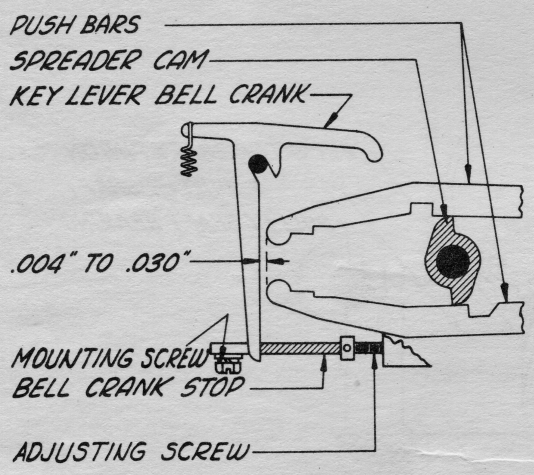


FIGURE 8

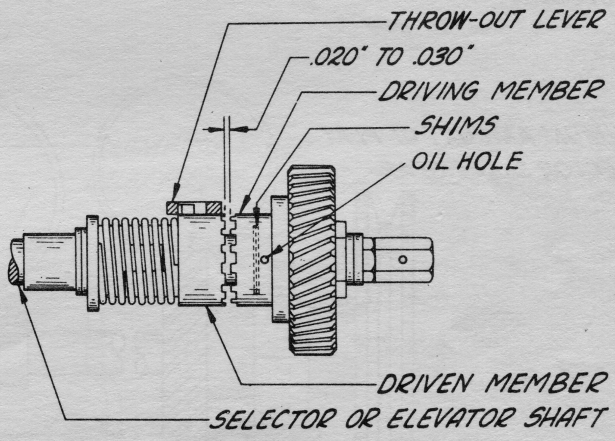


FIGURE 9

Drive Shaft Bearing Adjustment (Figure 1)

The drive shaft should line up with the operating shaft.

Position the drive shaft bearing by means of the enlarged mounting holes in the casting to meet this requirement.

Drive Shaft Gear Play Adjustment

There should be a minimum of play, without binding, between the drive shaft gear and the pinion for one complete revolution of the drive shaft gear. Add or remove shims between the drive shaft bearing and the base to meet this requirement. (See Figure 1 for location of parts.) If shims are added or removed, recheck the drive shaft bearing adjustment.

(D) This adjustment should be checked with the selecting assembly removed.

NOTE: After making a single adjustment, check related adjustments.

Drive Shaft Collar Adjustment (Figure 1)

The drive shaft should have some end play, not more than .006".

Position the drive shaft collar by means of its set screws to meet this requirement.

Selector and Elevator Shaft Clutch Adjustments (Figure 9)

When the selector and elevator shaft clutches are fully disengaged, there should be .020" to .030" clearance between the teeth of the driven and driving members of both clutches.

This clearance may be obtained by adding or removing shims between the driving clutch members and their respective bushings. When reassembling a driving clutch member, the oil holes in the bushing should line up with the holes in the driving clutch member.

Pulley Shaft Bearings Adjustment (Figure 10)

There should be a minimum of play, without binding, between the elevator shaft pinion and the selector shaft gear on the pulley shaft and the gears on the elevator and selector shafts, for one complete revolution of each gear.

Add or remove shims between the pulley shaft bearings and the casting to meet this requirement.

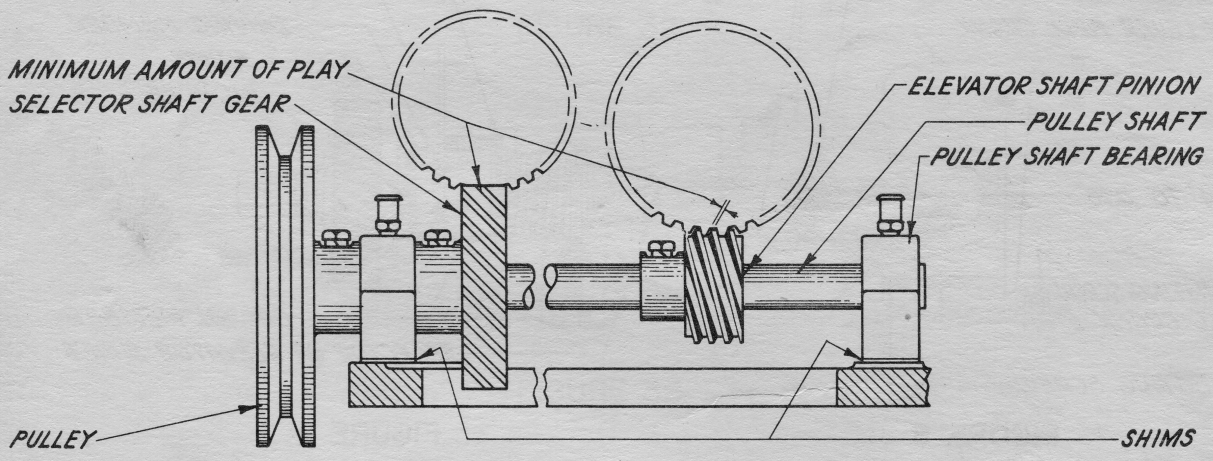


FIGURE 10

Selector Shaft End Play Adjustment (Figure 11)

The selector shaft should have some end play, not more than .006".

To adjust, loosen the nuts that lock the selector shaft front bearing and back off the bearing until it clears the shoulder on the shaft. The end play may then be obtained by positioning the tape feed cam on the selector shaft.

NOTE: When the selector shaft is in the stop position, the heads of the screws mounting the tape feed cam, selector cam, and the transfer bail cam should be on top.

Elevator Shaft End Play Adjustment (Figure 11)

The elevator shaft should have some end play, not more than .006".

NOTE: After making a single adjustment, check related adjustments.

To adjust loosen the nuts that lock the elevator shaft front bearing and back off the bearing until it clears the shoulder on the shaft. The end play may then be obtained by positioning the elevator cam on the elevator shaft.

NOTE: When the elevator shaft is in the stop position, the head of the elevator cam mounting screw should be on top.

Selector and Elevator Shafts Front Bearings Adjustment (Figure 11)

There should be some clearance not more than .006" between the front bearings on the selector and elevator shafts and the shoulders on the shafts, when the play of the shafts is taken up in a direction to make this clearance a minimum.

Adjust by means of the front bearing lock nuts.

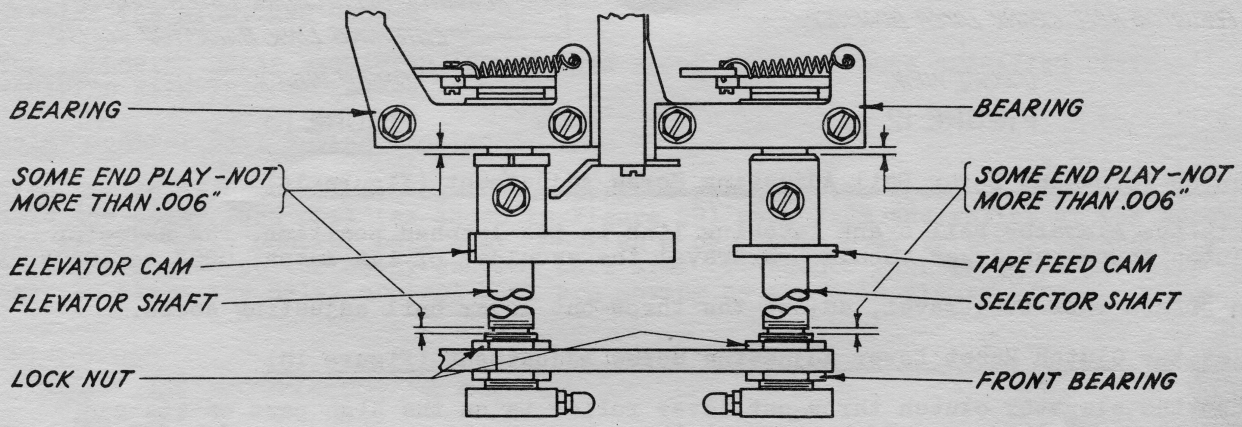


FIGURE 11

Elevator Bell Crank Latch Bracket Adjustment (Figure 12)

With the push bars on the high parts of the spreader cam, set up the elevator combination by moving #2 code bar to the left and numbers 0, 1, 3, 4, and 5 code bars to the right. Rotate the spreader cam until the operating bail rollers are on the centers of the high parts of their cams. The elevator bell crank latching link should overtravel the elevator bell crank latch .010" to .020".

Position the elevator bell crank latch bracket by means of its elongated mounting holes to obtain this overtravel.

Elevator Bell Crank Latching Link Backstop Screw Adjustment (Figure 13)

NOTE: In order to check this adjustment, it will be necessary to remake it.

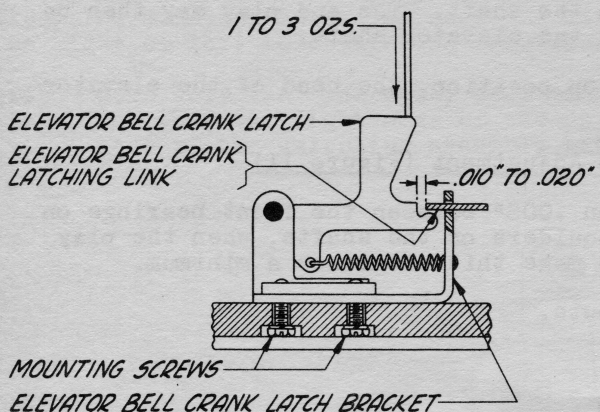
With the elevator and selector shafts in their stop positions and the elevator bell crank latching link in the unlatched position (extreme left), turn the latching link backstop screw in or out until it just touches the elevator bell crank latch bracket. Then advance the screw one-quarter turn and tighten the lock nut.

Clutch Throw-out Lever Bail Link Eccentric Screw Adjustment (Figure 14)

NOTE: In order to check this adjustment, it will be necessary to remake it.

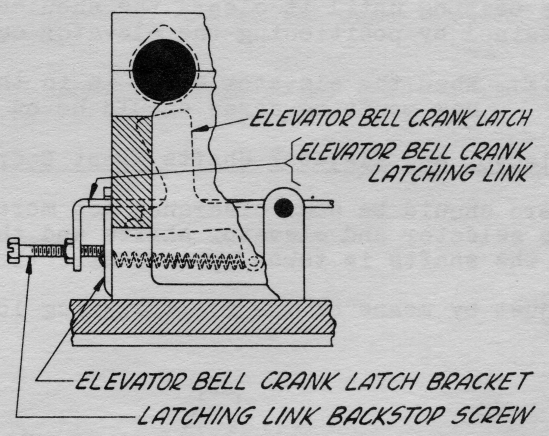
Turn the manual tape feed control lever handle to the "off" position (vertical). With the elevator and selector shafts in their stop positions and the elevator bell crank latching link in its latched position, adjust the clutch throw-out lever bail link eccentric screw so that the manual stop cam roller just touches the clutch throw-out lever bail. Tighten the eccentric screw lock nut.

NOTE: After making a single adjustment, check related adjustments.



(FRONT VIEW)

FIGURE 12



(REAR VIEW)

FIGURE 13

Clutch Throw-out Lever Bail Adjusting Screw Adjustment (Figure 14)

With the elevator bell crank latching link in its latched position, the selector clutch throw-out lever should overtravel the shoulder of its latch .020" to .030".

To obtain this overtravel, adjust the throw-out lever bail adjusting screw.

Elevator Clutch Reset Lever Adjusting Screw Adjustment (Figure 15)

When the elevator clutch throw-out lever roller is on the high part of its cam, the throw-out lever should overtravel the outer shoulder of the throw-out lever latch .020" to .030".

Adjust the reset lever adjusting screw to obtain this overtravel.

Selector and Elevator Clutch Throw-out Lever Spring Tensions (Figures 14 and 15)

Rotate the shafts so that the projections on the driven clutch members are at the top. Relatch the throw-out levers. Hook a 12 lb. scale over the upper end of the throw-out lever and pull toward the clutch member. It should require 1-1/2 to 2-1/2 lbs. to start each lever moving.

Selector and Elevator Clutch Detent Spring Tensions (Figure 16)

With the selector and elevator clutch detent lever roller on the lowest parts of the reset cams, hook a 32 oz. scale over the upper end of the detent lever and pull in line with the spring. It should require 22 to 32 ozs. to start each lever moving.

Selector Clutch Throw-out Lever Latch Spring Tension (Figure 14)

Turn the manual tape feed control lever to the "off" position. Hook an 8 oz. scale under the throw-out lever latch at the latching shoulder and pull up vertically. It should require 1 to 3 ozs. to start the latch moving.

Elevator Clutch Throw-out Lever Latch Spring Tension (Figure 15)

Rotate the elevator shaft until the clutch reset lever cam roller is on the high part of its cam. Hook a 32 oz. scale under the spring post on the throw-out lever latch and pull up vertically. It should require 8 to 12 ozs. to start the latch moving.

Elevator Bell Crank Spring Tension (Figure 17)

Unhook the elevator bell crank spring from the elevator bell crank. With a 32 oz.

NOTE: After making a single adjustment, check related adjustments.

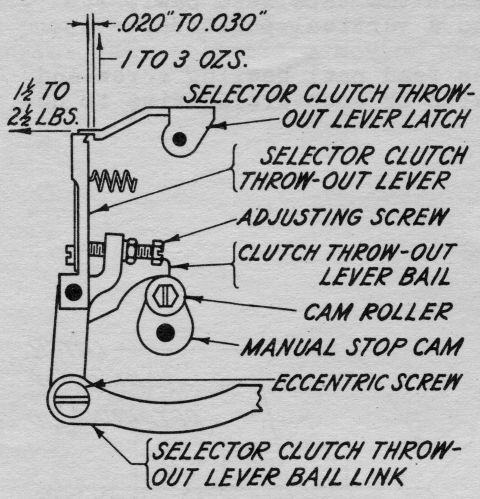


FIGURE 14

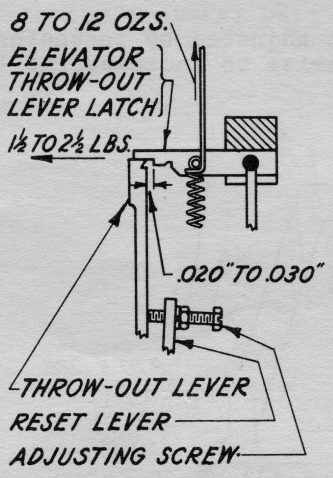


FIGURE 15

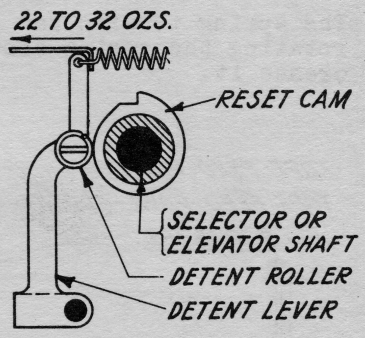


FIGURE 16

scale hooked in the spring eye, it should require 20 to 28 ozs. to stretch the spring to position length.

Elevator Bell Crank Latch Spring Tension (Figure 12)

With the push bars on the high parts of the spreader cam, set up the elevator combination by moving #2 code bar to the left, and numbers 0, 1, 3, 4, and 5 code bars to the right. Rotate the operating shaft until the operating bail lever rollers are on the centers of the high parts of their cams. With an 8 oz. scale pushing vertically downward against the upper end of the elevator bell crank latch, it should require 1 to 3 ozs. to start the latch moving.

Feed Wheel Detent Spring Tension (Figure 18)

With the detent roller between two ratchet teeth, hook a 32 oz. scale over the lower end of the detent lever and pull horizontally against the tension of the spring. It should require 15 to 18 ozs. to start the detent moving.

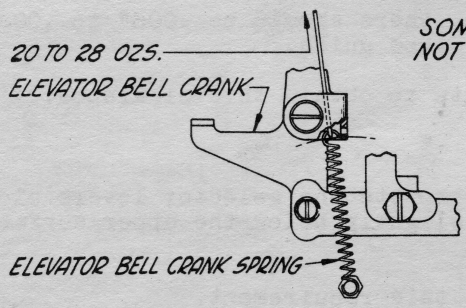


FIGURE 17

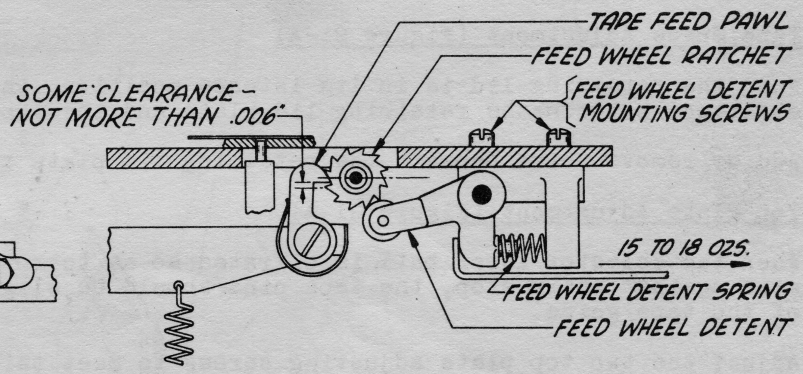


FIGURE 18

Tape Feed Pawl Spring Tension (Figure 19)

Remove the front top plate bearing (Figure 21-B). Unhook the top plate springs (Figure 22) and raise the top plate as far as possible. With the push end of an

NOTE: After making a single adjustment, check related adjustments.

8 oz. scale applied horizontally to the right edge of the tape feed pawl, it should require 2 to 3 ozs. to move the feed pawl to a vertical position.

The spring tension can be adjusted by loosening the feed pawl bearing screw and rotating the spring clockwise to increase the tension or counterclockwise to decrease it.

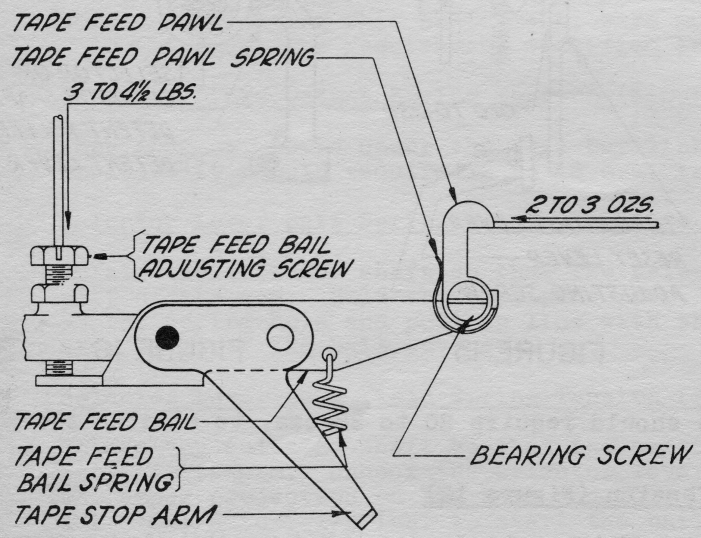


FIGURE 19

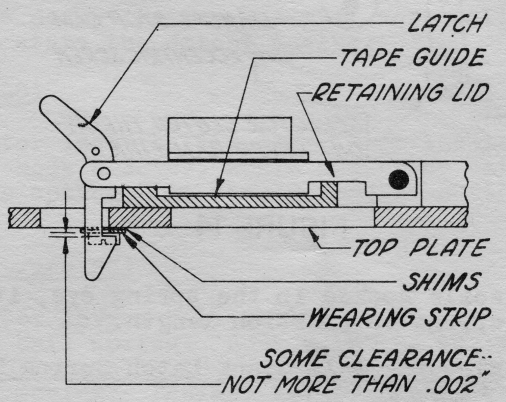


FIGURE 20

REPLACE THE FRONT TOP PLATE BEARING AND THE TOP PLATE SPRINGS.

Retaining Lid Latch Wearing Strip Adjustment (Figure 20)

When the retaining lid is held in its lowest position, there should be some clearance, not more than .002", between the latch and the wearing strip.

Adjust the retaining lid latch wearing strip by means of shims to meet this requirement.

Tape Space Adjustment (Figure 21-A)

When the retaining lid is in its latched position, there should be .006" to .008" clearance between the retaining lid plate and the tape guide.

Add or remove shims beneath the retaining lid plate to obtain this clearance.

Top Plate Adjustment (Figure 21-A)

When the selector lever bail is operated so as to rotate the selector levers clockwise against their stop, the tape pins should be slightly below the upper surface of the tape guide.

Adjust the two top plate adjusting screws to meet this requirement.

Top Plate Upstop Screw Adjustment (Figure 22)

There should be .010" to .020" clearance between the top plate upstop screw and the frame casting.

Adjust the top plate upstop screw to obtain this clearance.

NOTE: After making a single adjustment, check related adjustments.

NOTE: On some operating units the upstop screw is not provided, in which case the front top plate bearing is stopped against the frame casting.

Top Plate Spring Tension (Figure 22)

Hook a 32 oz. scale under the end of the tape guide and pull vertically upward. It should require 8 to 20 ozs. to start the top plate moving.

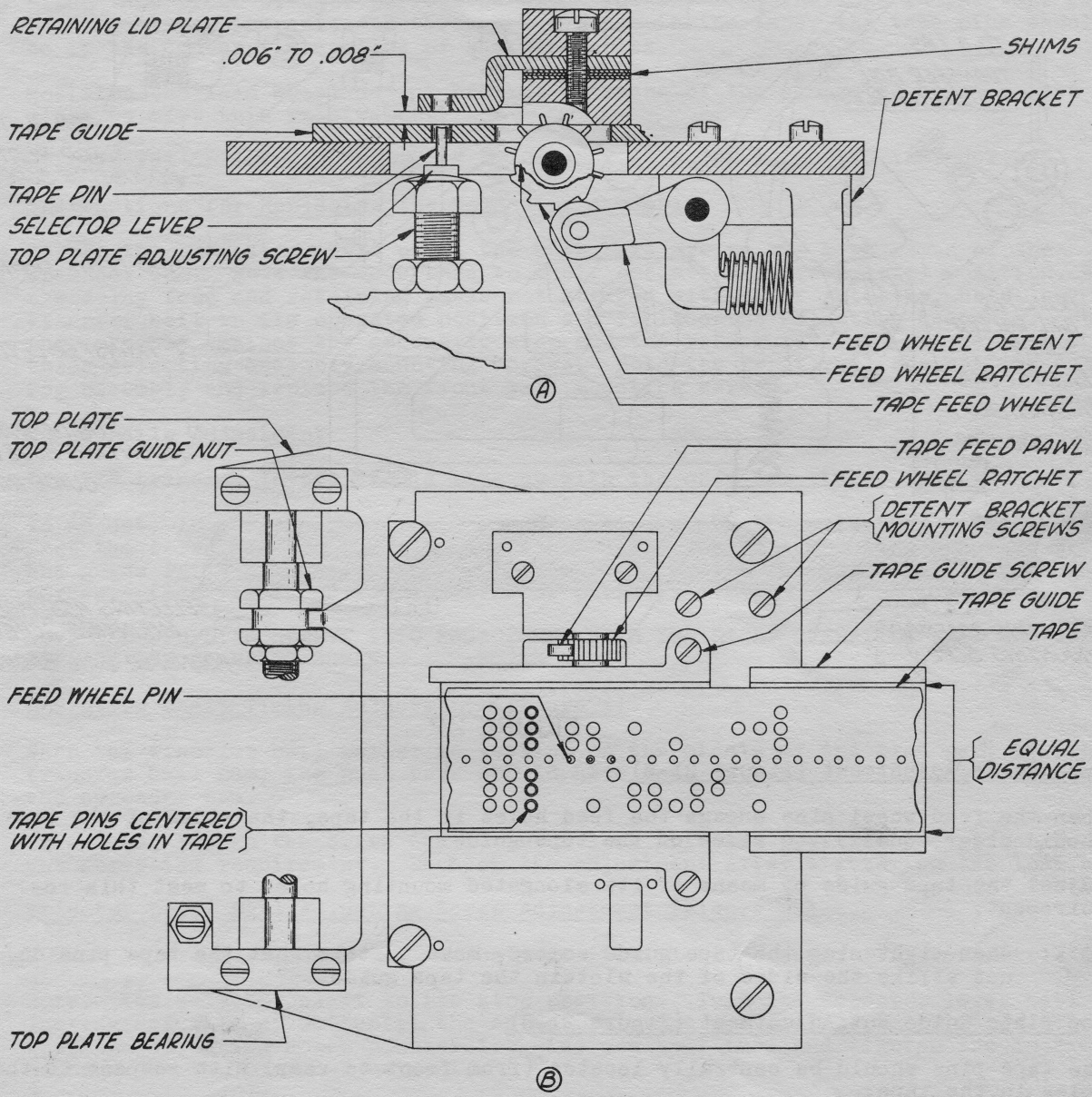


FIGURE 21

NOTE: After making a single adjustment, check related adjustments.

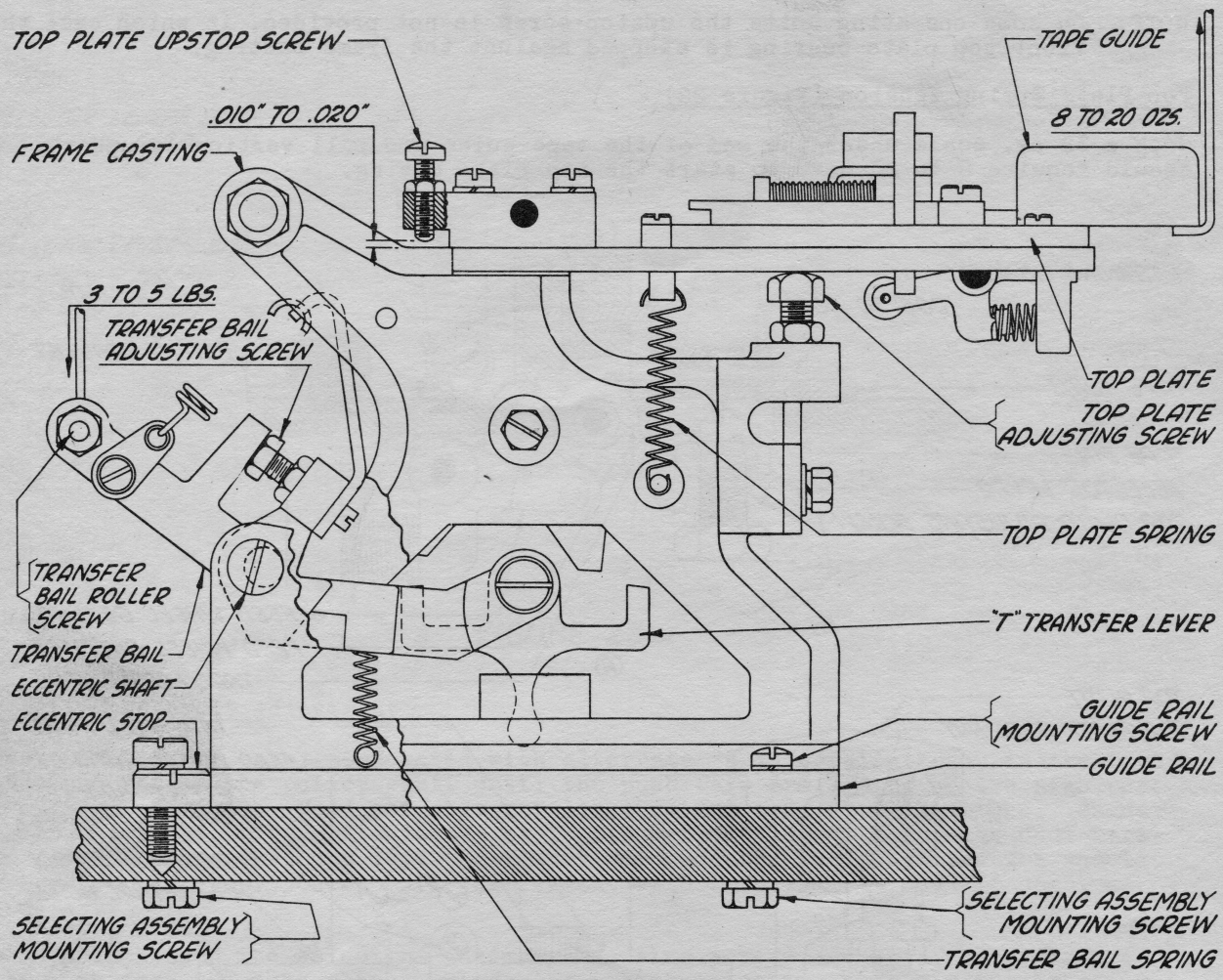


FIGURE 22

Tape Guide Adjustment (Figure 21-B)

When the feed wheel pins engage the feed holes in the tape, the sides of the tape should clear equally the sides of the tape guide.

Adjust the tape guide by means of its elongated mounting holes to meet this requirement.

NOTE: When tightening the tape guide screws, make certain that the tape pins do not strike the sides of the slot in the tape guide.

Top Plate Guide Nut Adjustment (Figure 21-B)

The tape pins should be centrally located (from front to rear) with respect to the holes in the tape.

Adjust by means of the top plate guide nut.

Retaining Lid Plate Adjustment

When the tape pins are in their uppermost position and the retaining lid is latched, the tape pins should be centrally located with respect to the holes in the retaining lid plate.

NOTE: After making a single adjustment, check related adjustments.

Position the retaining lid plate to meet this requirement. (See Figure 21-A for location of parts.)

Feed Wheel Detent Adjustment (Figure 21-B)

NOTE: Before checking this adjustment, perforate a short piece of tape with "rub-out" combinations and check this tape to see that it conforms to gauge No. 2215.

Place this piece of tape perforated with "rub-out" combinations in the tape guide. With the tape pins extended through the holes in the tape, the tape pins should be in the center (laterally) of the tape holes.

Position the feed wheel detent bracket by means of the elongated holes in the top plate to meet this requirement.

REPLACE THE SELECTOR ASSEMBLY IN ACCORDANCE WITH THE FOLLOWING INSTRUCTIONS:

Instructions for Replacing the Selecting Assembly

Rotate the operating shaft until the push bars are on the high parts of the spreader cam. Move the code bars to their operated (extreme left) position. With the delay feed and retaining pawls not engaged with their ratchets, hold the transfer bail in its operated position and replace the selecting assembly. Hold the assembly against the eccentric stop and the rear guide rail and replace the three selecting assembly mounting screws. Hold the front rail against the selecting assembly and replace the front rail mounting screws.

Guide Rails Adjustment

The "T" transfer levers should line up with the code bar links.

To adjust, loosen the guide rail mounting screws and the selecting assembly to meet the foregoing requirements and tighten the assembly mounting screws. Move the guide rails against the assembly base and tighten the guide rail mounting screws. (See Figure 22 for location of parts.)

MOVE THE COUPLING SLEEVE INTO ENGAGEMENT WITH THE RIGHT OPERATING BAIL CAM AND REPLACE THE CLAMPING SCREW.

Operating Shaft Timing Adjustment (Figure 1)

When the transfer bail roller is resting on the middle of the high part of the transfer bail cam, the push bars should have just dropped off the high parts of the spreader cam.

To adjust, loosen the drive shaft pinion lock nuts and position the pinion to meet the foregoing requirement. Recheck the adjustment after tightening the lock nuts.

Selector Lever Bail Adjusting Screw Adjustment (Figure 23)

NOTE: In order to check this adjustment, it will be necessary to remake it.

Rotate the selector shaft to its stop position. Turn the selector lever bail adjusting screw in or out until the selector levers are against their stop. Then turn the adjusting screw counterclockwise one-half turn and tighten the lock nut. Recheck the top plate adjustment.

Transfer Bail Eccentric Shaft Adjustment (Figure 24)

Insert a piece of tape, perforated with alternate "4 Y" combinations, in the tape guide and rotate the selector shaft slowly. When the "T" transfer levers engage the selector levers, the amount of "bite" of the selector levers on the "T" transfer levers should be the same for selector levers in both right and left positions. Check this requirement with both the "4" and "Y" combinations.

To adjust, loosen the lock nut of the transfer bail eccentric shaft (Figure 22) and rotate the shaft.

NOTE: After making a single adjustment, check related adjustments.

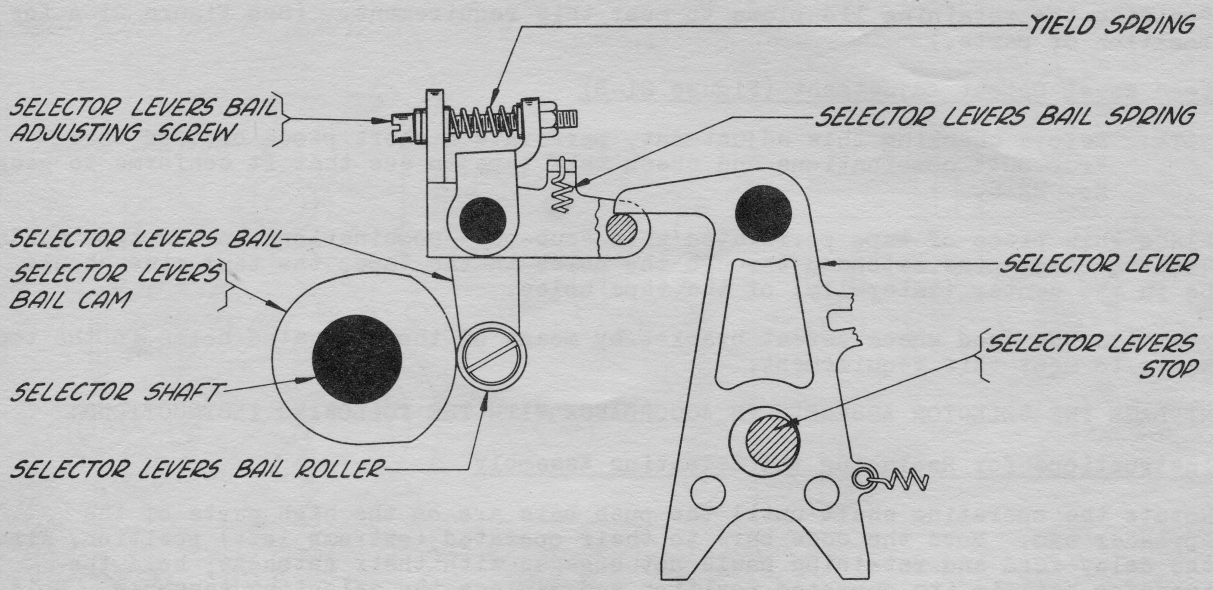


FIGURE 23

Selecting Assembly Adjustment

Insert a piece of tape, perforated with alternate "4 Y" combinations, in the tape guide and rotate the pulley shaft until the push bars are riding on the high part of the spreader cam. Hold the code bar links detent away from the links. When the transfer bail is operated manually to its extreme limit, alternate code bars are moved to the right and left. At least one code bar in each direction should be against its stop. Check this requirement with both the "4" and "Y" combinations.

To adjust, loosen the selecting assembly mounting screws and move the eccentric stop away from the base plate. Slide the entire selecting assembly in the rails so that the travel of the code bars will meet the foregoing requirement. Tighten the selecting assembly mounting screws. Turn the eccentric stop against the base plate and tighten the mounting screw. (See Figure 22 for location of parts.) Recheck the "Transfer Bail Eccentric Shaft Adjustment, Top Plate Adjustment, and Selector Lever Bail Adjusting Screw Adjustment."

Transfer Bail Adjusting Screw Adjustment (Figure 24)

Insert a piece of tape, perforated with alternate "4 Y" combinations, in the tape guide and rotate the selector shaft until the transfer bail roller is on the high part of the transfer cam. Hold the code bar links detent roller away from the code bar links. There should be some clearance, not more than .030", between the shoulders on the code bars and the code bar stops for both the "4" and "Y" combinations.

Adjust by means of the transfer bail adjusting screw (Figure 22).

Transfer Bail Spring Tension (Figure 22)

Rotate the selector shaft until the selector shaft clutch is disengaged. Apply the push end of a 12 lb. scale to the transfer bail directly over the bail roller bearing screw and push vertically downward. It should require 3 to 5 lbs. to start the bail moving.

Transfer Bail Yield Spring Tension (Figure 25)

Hold the transfer bail in the downward position and apply the push end of a 12 lb.

NOTE: After making a single adjustment, check related adjustments.

scale to the end of the transfer bail directly over the transfer bail roller screw and push vertically downward. It should require at least 10-1/2 lbs. to start the transfer bail roller arm moving away from the transfer bail adjusting screw.

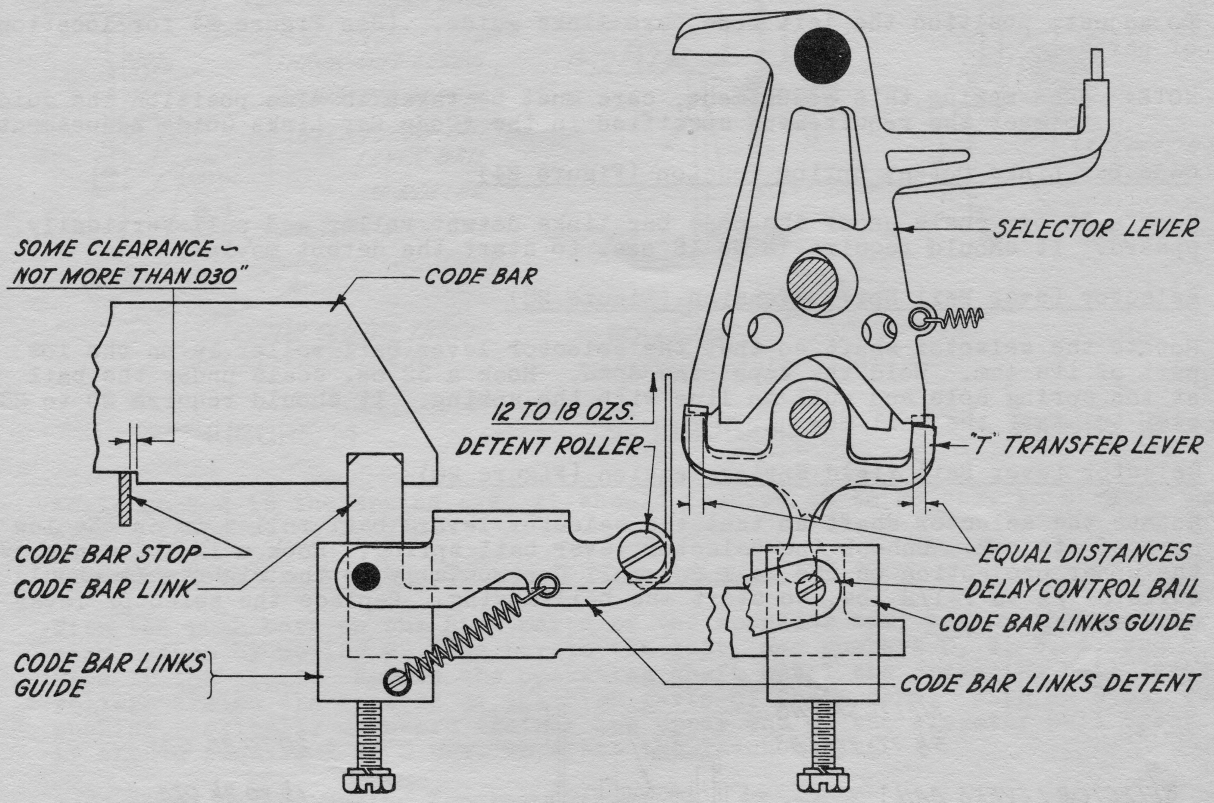


FIGURE 24

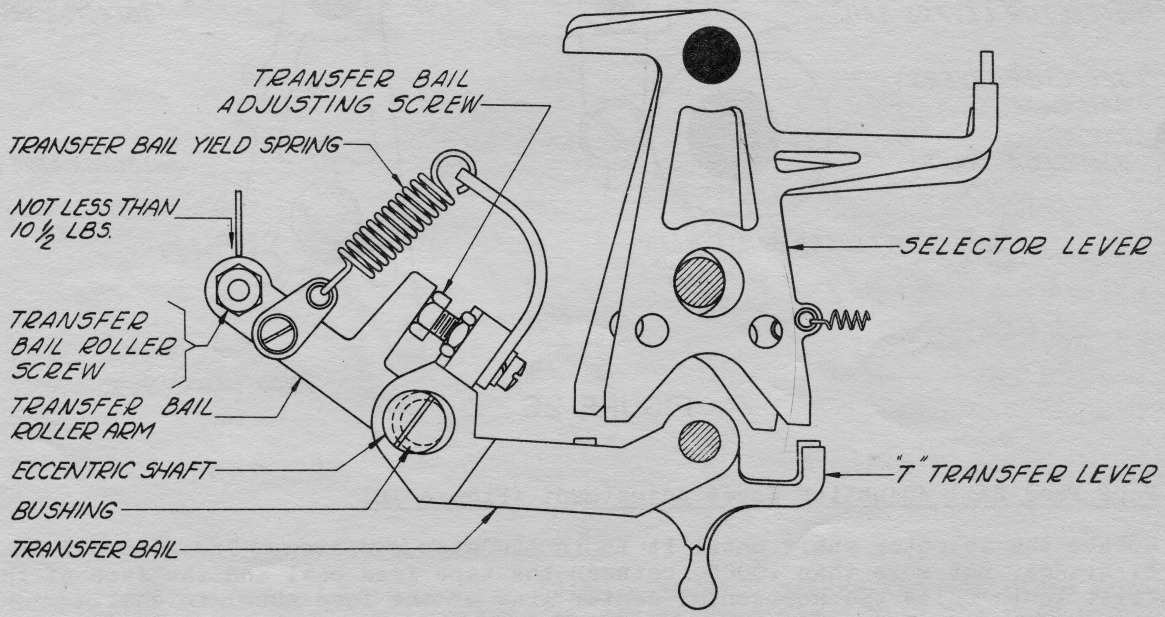


FIGURE 25

NOTE: After making a single adjustment, check related adjustments.

Code Bar Links Detent Adjustment

When the code bar links are moved to the right or left positions, the projections on the code bar links should move an equal distance beyond the center of the code bar links detent roller.

To adjust, position the left code bars links guide. (See Figure 24 for location of parts.)

NOTE: When making this adjustment, care must be taken to also position the guide to meet the requirement specified in the "Code Bar Links Guide Adjustment."

Code Bar Links Detent Spring Tension (Figure 24)

Hook a 32 oz. scale under the code bar links detent roller and pull vertically upward. It should require 12 to 18 ozs. to start the detent moving.

Selector Lever Bail Spring Tension (Figure 26)

Rotate the selector shaft so that the selector lever bail roller is on the low part of its cam. Hold the tape pins down. Hook a 32 oz. scale under the bail at the spring hole and pull in line with the spring. It should require 20 to 28 ozs. to start the bail moving.

Selector Lever Bail Yield Spring Tension (Figure 26)

Rotate the selector shaft so that the selector levers bail roller is on the low part of its cam. Unhook the selector lever bail spring. Hook a 12 lb. scale over the upper projection on the bail and pull horizontally to the right. It should require 5-1/2 to 7-1/2 lbs. to start the bail moving. Replace the selector lever bail spring.

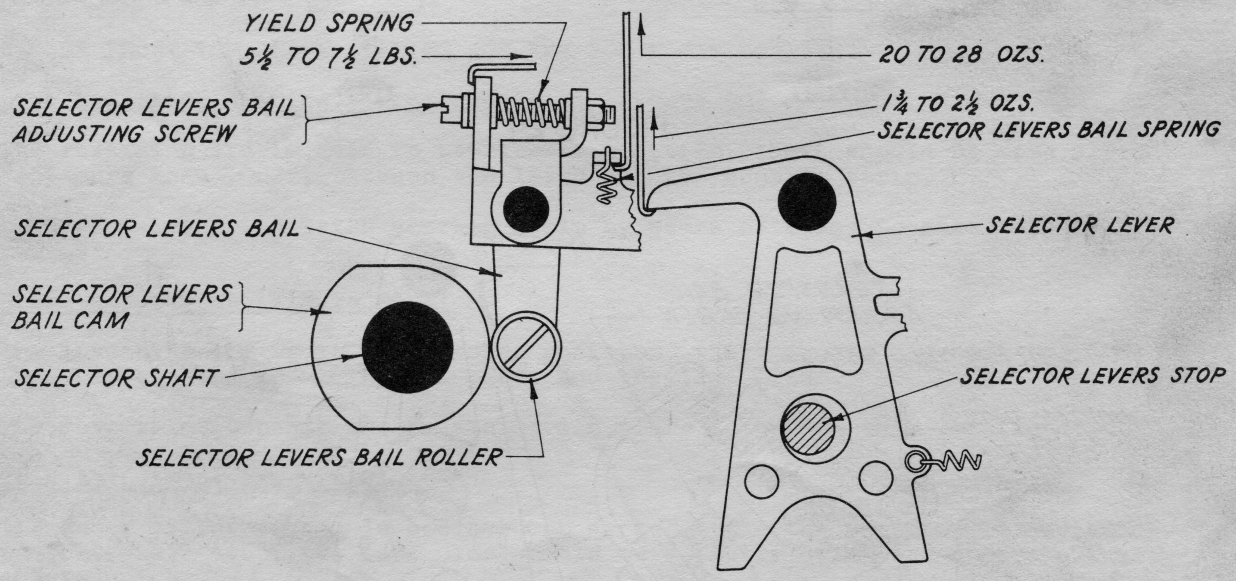


FIGURE 26

Tape Feed Bail Adjusting Screw Adjustment (Figure 18)

Rotate the selector shaft until it is in its stop position. There should be some clearance, not more than .006", between the tape feed pawl and the face of the first tooth below the horizontal center line of the feed wheel ratchet.

NOTE: After making a single adjustment, check related adjustments.

Adjust the tape feed bail adjusting screw (Figure 19) to obtain this clearance.

Tape Feed Bail Spring Tension (Figure 19)

Rotate the selector shaft to its stop position. Apply the push end of a 12 lb. scale against the head of the tape feed bail adjusting screw and push vertically downward. It should require 3 to 4-1/2 lbs. to start the bail moving.

Selector Lever Spring Tension (Figure 26)

Rotate the selector shaft until the selector lever bail roller and the transfer bail roller are on the low part of their cams. Hold the selector lever bail down until the yield spring is fully compressed. Hook an 8 oz. scale beneath the left end of each selector lever and pull vertically upward. It should require 1-3/4 to 2-1/2 ozs. to start each selector lever moving.

REPLACE THE RIGHT END HANGER.

THE FOLLOWING DELAY MECHANISM ADJUSTMENTS APPLY ONLY TO THOSE OPERATING UNITS EQUIPPED WITH THIS MECHANISM

Delay Control Bail Spring Tension

With the delay control bail in its unoperated position (as shown in Figure 28), hold the delay feed pawl (as shown in Figure 29) away from the roller at the upper end of the delay control bail arm. Hook an 8 oz. scale over this roller and pull at right angles to the delay control bail arm. It should require 3-1/2 to 6-1/2 ozs. to start the delay control bail arm moving as shown in Figure 27-A.

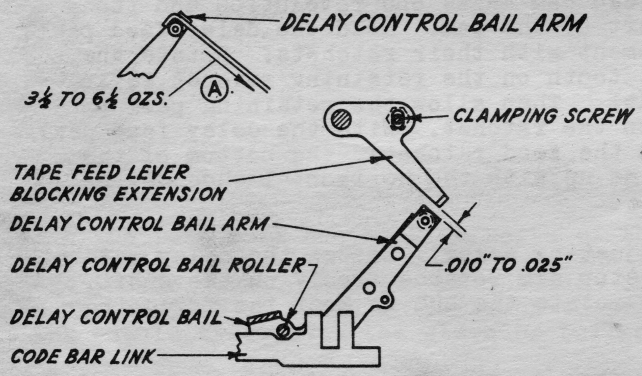


FIGURE 27

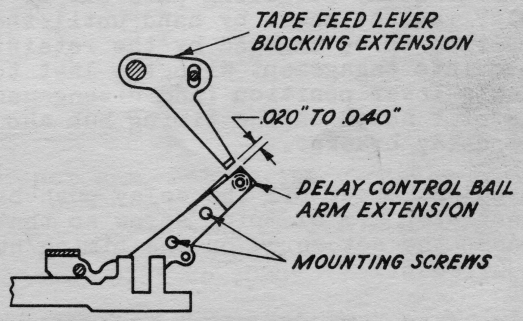


FIGURE 28

Delay Control Bail Arm Adjustment (Figure 28)

There should be .020" to .040" clearance between the tape feed lever blocking extension and the delay control bail arm extension when the tape feed lever blocking extension is in its lowest position.

To adjust, rotate the pulley shaft (with no tape in the selecting assembly), until the tape feed lever blocking extension is in its lowest position. Position the delay control bail arm by means of its enlarged mounting holes to obtain the proper clearance.

Delay Bracket Adjustment (Figures 29 and 30)

With no tape in the selecting assembly, rotate the pulley shaft until the delay control bail is in its unoperated position. The delay push bail adjusting screw should line up with the delay selector lever, and there should be .010" to .025" clearance between the delay retaining pawl and the delay retaining ratchet.

NOTE: After making a single adjustment, check related adjustments.

To adjust, position the delay bracket forward or backward, by means of its elongated mounting holes, to meet the first requirement, and at the same time to the right or left to obtain the required clearance.

NOTE: Make sure that the delay feed pawl moves freely in the delay guide clamp and that the right edge of the delay bracket is parallel with the right edge of the selecting assembly base.

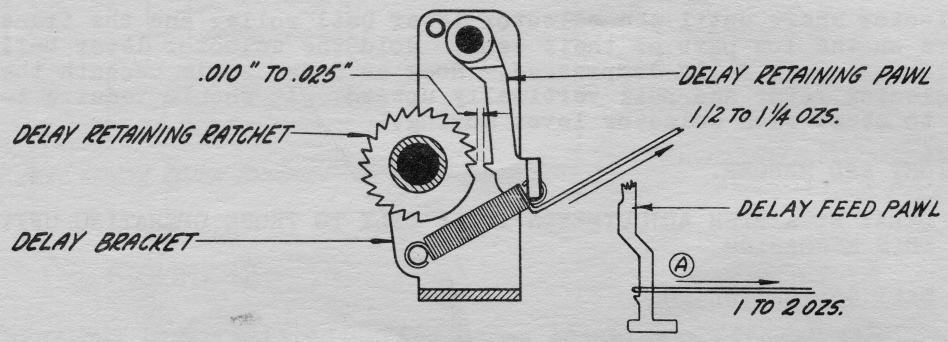


FIGURE 29

Timing Hub Position (Figure 30)

Place a piece of tape perforated with the "0145" combination over the tape pins and turn the pulley shaft until the tape feed cam makes one revolution and the tape feed cam roller returns to the low part of the cam. Hold the delay feed pawl and the delay retaining pawl out of engagement with their ratchets. Rotate the delay ratchet shaft by hand until the last tooth on the retaining ratchet is in position to be engaged by the retaining pawl. Then allow the retaining pawl to move into engagement with the last tooth on the ratchet. With the delay feed pawl in its lower position (and disengaged from the feed ratchet), the bottom of the "Zero" V notch on the timing hub should line up with the horizontal shoulder of the delay bracket.

To adjust, back off the delay push bail adjusting screw. Loosen the delay ratchet shaft stop arm clamping screw so that the stop arm rotates freely on the shaft. Loosen the set screw on the timing hub and rotate the hub to meet the foregoing requirement.

Delay Feed Pawl Operating Lever Adjustment (Figure 31)

With the "0145" combination selected and the pulley shaft rotated until the delay feed pawl has reached its uppermost travel, the delay feed pawl should move the delay feed ratchet sufficiently to cause a tooth on the delay retaining ratchet to overtravel the delay retaining pawl a slight amount, not over .005".

To adjust, loosen the screw that clamps the delay feed pawl operating lever to the tape feed lever and position the operating lever with respect to the tape feed lever.

Delay Push Bail Adjusting Screw Adjustment (Figure 32)

With the "0145" combination selected, rotate the pulley shaft until the delay retaining pawl engages the last tooth on its ratchet and the delay feed pawl reaches its uppermost travel. Hold the delay selector lever to the left against its stop and hold the delay push bail against the delay retaining ratchet stud. There should be some clearance, not more than .005" between the delay selector lever and the delay push bail adjusting screw.

Adjust the delay push bail adjusting screw to obtain the required clearance.

NOTE: After making a single adjustment, check related adjustments.

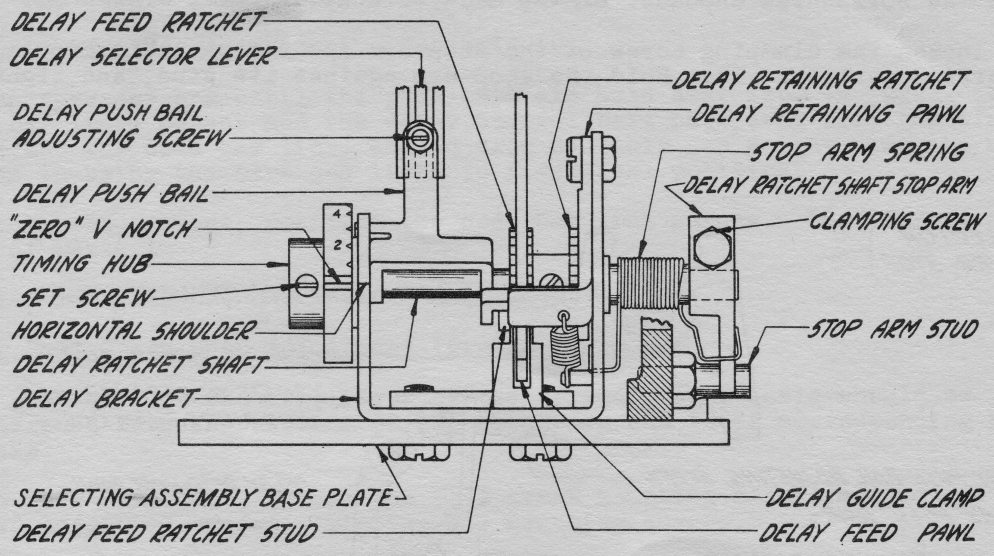


FIGURE 30

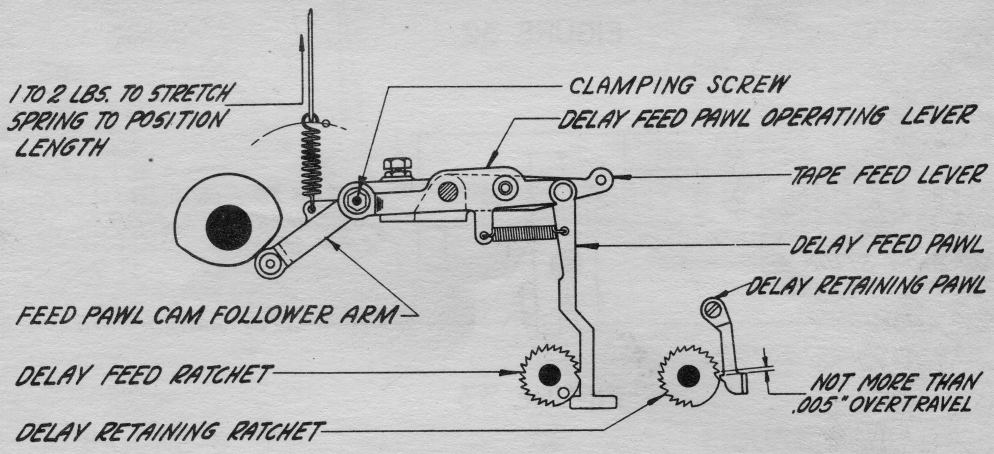


FIGURE 31

Stop Arm Spring Adjustment (Figure 33)

Hook an 8 oz. scale over the stop arm just above the stud and pull toward the right. It should require 4 to 7 ozs. to start the stop arm moving away from the stud.

To adjust, remove the stop arm stud and allow the stop arm to rotate until the spring has no tension. Make sure that the spring is seated against the rear edge of the delay bracket and the forward edge of the stop arm. Then rotate the stop arm in a direction that will wind the spring one revolution past the hole from which the stud was removed. Replace the stud and check for the required tension.

Time Delay Adjustment (Figures 30 and 33)

It is possible to produce a time delay equivalent to 0 to 18 operations of the operating unit. With the delay mechanism unoperated, the center of the notch on

NOTE: After making a single adjustment, check related adjustments.

the timing hub, which represents the required number of delay operations, should be opposite the horizontal shoulder of the delay bracket.

To adjust, loosen the clamping screw of the stop arm and rotate the timing hub to the required position. Then hold the stop arm against its stud, and tighten the clamping screw.

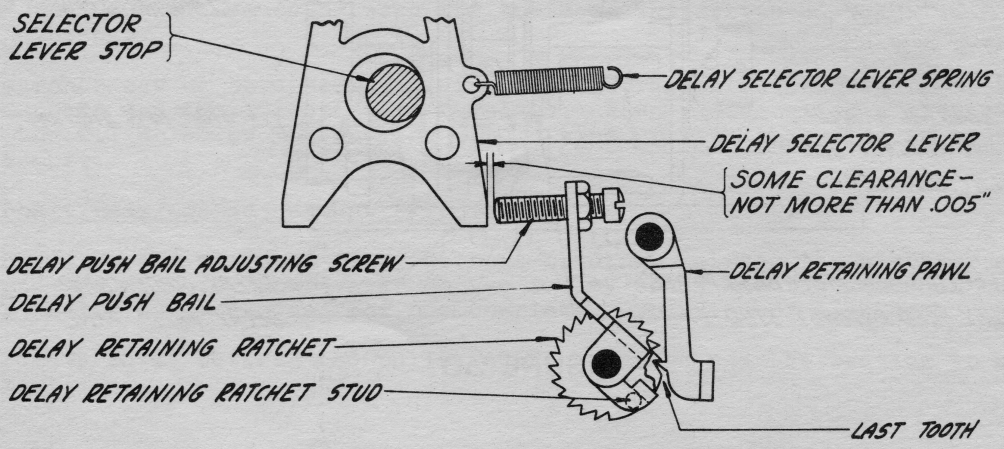


FIGURE 32

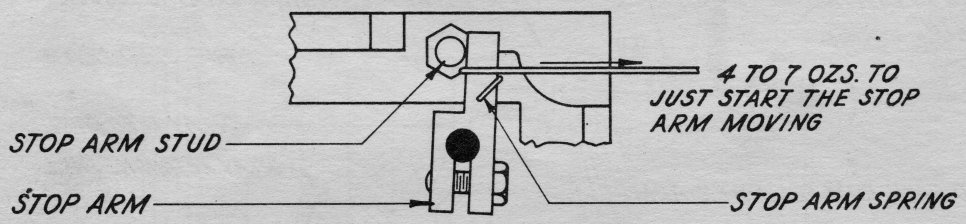


FIGURE 33

NOTE: For lateral rail operation, the delay mechanism should be set for a time delay of three operations.

Tape Feed Lever Blocking Extension Adjustment (Figure 27)

There should be .010" to .025" clearance between the lower end of the tape feed lever blocking extension and the upper end of the delay control bail arm, when the delay control bail roller is in the notches of the code bar links, and the pulley shaft is rotated until the tape feed pawl has reached its uppermost travel.

To adjust, position the tape feed lever blocking extension by means of its clamping screw to obtain the required clearance.

Delay Retaining Pawl Spring Tension (Figure 29)

With the tape feed stop bail in its unoperated position, hook an 8 oz. scale on the delay retaining pawl and pull in line with the spring. It should require 1/2 to 1-1/4 ozs. to start the pawl moving.

NOTE: After making a single adjustment, check related adjustments.

Delay Feed Pawl Spring Tension (Figure 29-A)

With the delay control bail in its unoperated position, hold the delay retaining pawl away from the delay feed pawl, hook an 8 oz. scale just above the tooth on the feed pawl, and pull horizontally to the right. It should require 1 to 2 ozs. to start the pawl moving.

Feed Pawl Cam Follower Arm Spring Tension (Figure 31)

Turn the pulley shaft until the feed pawl cam follower arm roller is on the low part of its cam. Unhook the spring at its upper end. With a 32 oz. scale hooked in the spring eye, it should require 16 to 32 ozs. to stretch the spring to its position length.

MOUNT THE OPERATING UNIT ON THE SLUG LINE CASTING MACHINE IN ACCORDANCE WITH THE FOLLOWING INSTRUCTIONS:

Instructions for Mounting the Operating Unit on the Slug Line Casting Machine

Remove the two hanger pilot screws from the operating unit. Back off the knurled clamp screw mounted on the keyboard base casting and the two stop screws projecting from the left hanger. Raise the assembling elevator to its mid-position where it will be supported by the elevator latch.

Place both arms under the operating unit, supporting it on the hands and forearms and raise it to a position under the keyboard where the openings in the operating unit hangers will be in line with the hanger guides. Hold the operating unit level and slide it into position. Insert the two hanger pilot screws.

Operating Unit Position (Figure 34)

The key lever bell cranks should align with the key lever extensions.

Position the operating unit by means of the two stop screws projecting from the hanger and also by means of the knurled clamp screw mounted on the keyboard base casting, to meet the foregoing requirement.

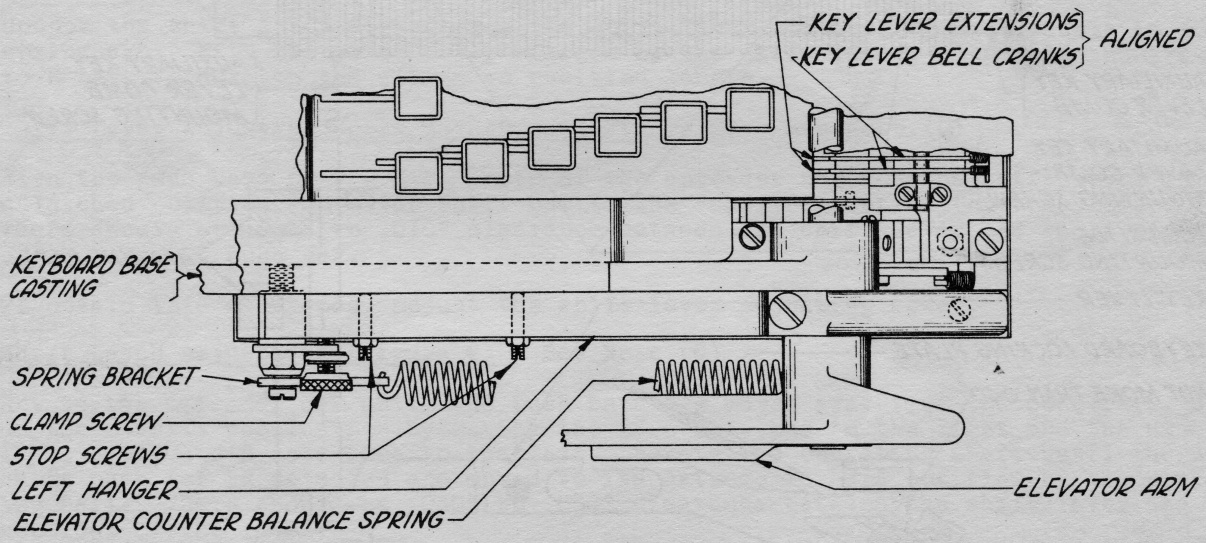


FIGURE 34

NOTE: After making a single adjustment, check related adjustments.

THE FOLLOWING TWO ADJUSTMENTS APPLY TO "LINOTYPE" SLUG LINE CASTING MACHINES ONLY:

Auxiliary Key Lever Guide Comb Adjustment

NOTE: Before checking this adjustment, the front and rear cam frames must be removed from the slug line casting machine.

Move the lock slide to the left and depress any key lever. The corresponding key bar should then be stopped in its upward travel by the banking bar. When the key lever is released, the corresponding key bar should be allowed to fully return and rest on the banking bar.

To adjust, loosen the lock slide cam mounting screws and move the right end of the cam to its lowest position. Tighten the lock slide cam mounting screws. Then loosen the auxiliary key lever guide comb mounting screws and the lock slide mounting screws and position the comb by means of its elongated holes. Tighten the mounting screws. (See Figure 35 for location of parts.)

Lock Slide Cam Adjustment (Figure 35)

With the lock slide in its right position, there should be not more than .040" between the bottom edge of the key levers and the bottom edge of the slots in the keyboard locking plate.

To adjust, loosen the lock slide cam mounting screws and position the cam, in the lock slide, by means of its elongated hole. Tighten the mounting screws.

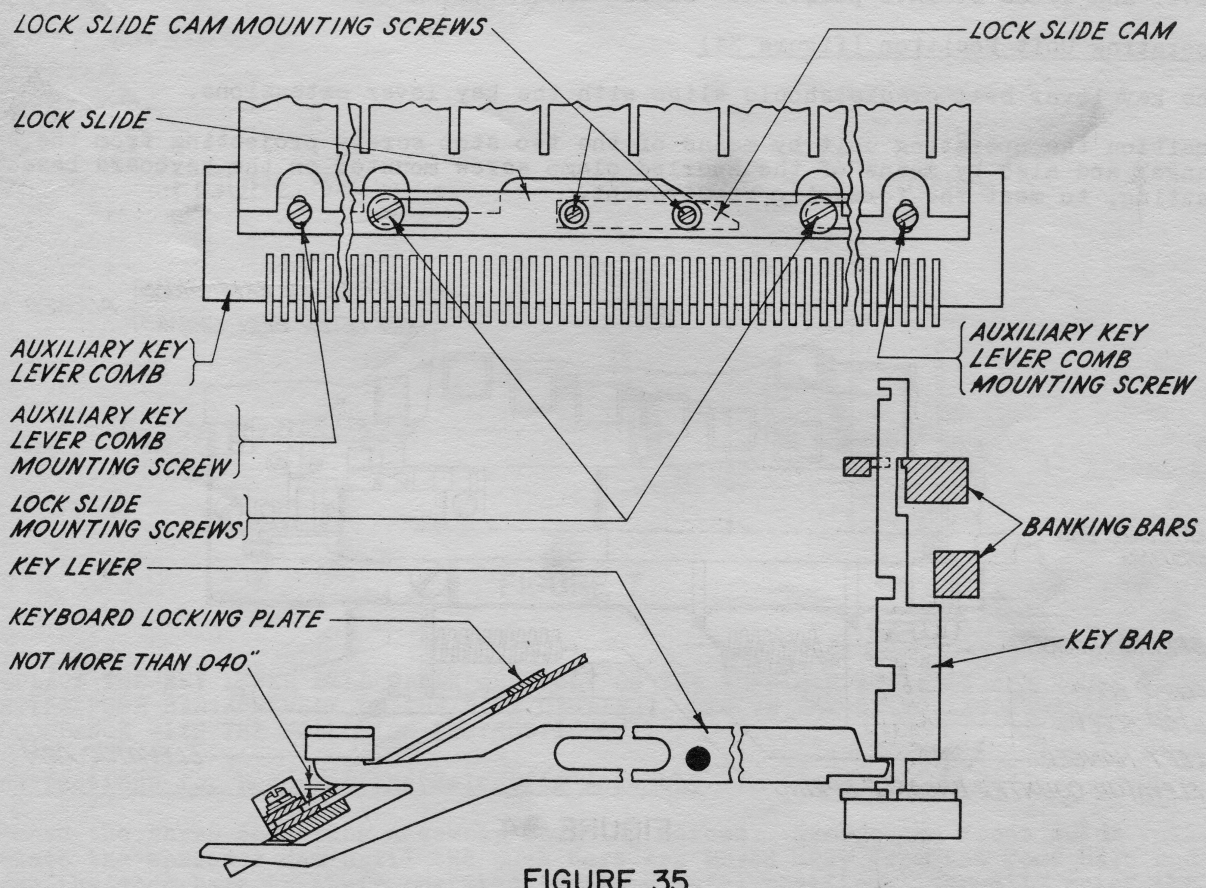


FIGURE 35

NOTE: After making a single adjustment, check related adjustments.

Key Lever Bell Crank Adjustment (Figure 36)

With any key bar in its lowest position (unoperated) and the associated key lever held so that it is in contact with the top edge of the notch in the key bar, there should be a clearance of .015" to .030" between the bell crank and its associated lever. All bell cranks should meet this requirement.

To adjust, add or remove shims between the key lever bell crank assembly casting and the push bar assembly casting.

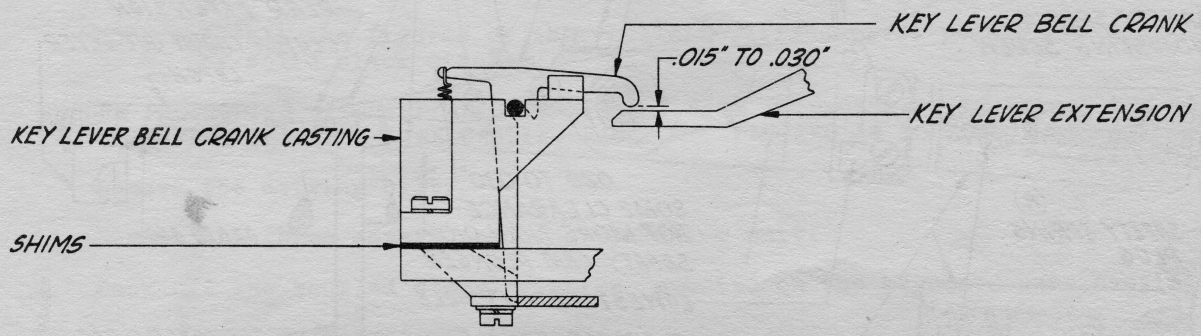


FIGURE 36

Elevator Cam Roller Casting Adjusting Screw Adjustment (Figure 37)

There should be .020" to .030" clearance between the trip arm lug and the elevator cam roller casting when the lowest detent hole in the trip arm engages its detent plunger.

To adjust, loosen the elevator handle clamp screw so that the handle rotates freely on the shaft. With the safety spring tension sufficient to hold the elevator cam roller casting adjusting screw against the elevator handle casting, adjust the elevator cam roller casting adjusting screw to obtain the required clearance.

Elevator Handle Clamp Screw Adjustment (Figure 37)

The elevator arm shaft should have a minimum of end play without binding in any operating position, and there should be some clearance, not more than .010", between the elevator cam roller and the lowest part of the elevator cam, when the assembling elevator is fully seated in its lower (assembling) position and the elevator shaft is in its stop position.

To adjust, position the elevator handle by means of its clamping screw to meet the foregoing requirements.

Selector Trip Arm Extension Adjustment (Figure 37)

Rotate the elevator shaft to its stop position and see that the assembling elevator is in the assembling position and the selector trip arm is detented in the lowest hole. The selector trip arm rear extension should hold the selector clutch throw-out lever latch clear of the selector clutch throw-out lever by .020" to .040".

To adjust, position the rear extension on the trip arm by means of its elongated hole and clamping screws.

Elevator Arm Shaft End Nuts Adjustment

With the safety spring plug removed to relieve the spring pressure between the safety cam plunger and its cam, the elevator cam roller casting should rotate freely on the elevator arm shaft, and there should be some clearance, not more than .006", between the trip arm bushing and the flat washer, when all the play is taken up against the elevator handle.

NOTE: After making a single adjustment, check related adjustments.

To adjust, position the elevator arm shaft end nuts (Figure 37) to meet the foregoing requirements. Replace the safety spring plug.

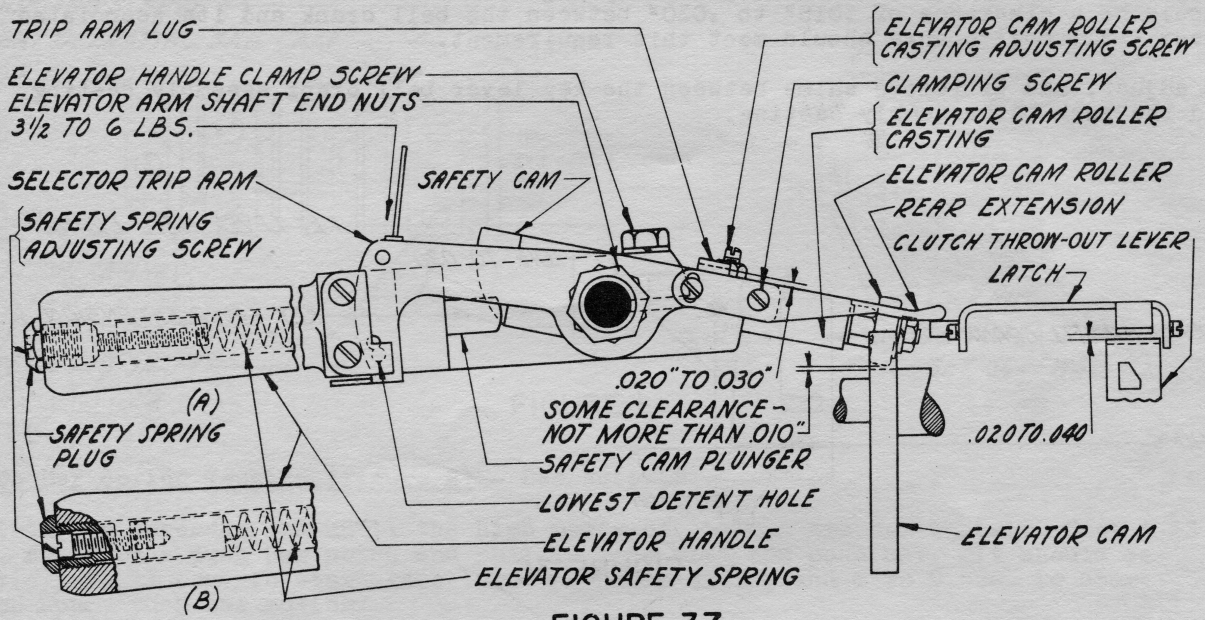


FIGURE 37

Elevator Counterbalance Spring Adjustment (Figure 40)

Hook a 32 oz. scale beneath the assembling elevator gate and pull vertically upward. It should require 12 to 20 ozs. to start the assembling elevator moving from its lower position.

To adjust, remove the loop end of the counterbalance spring from the elevator arm projection. If additional spring tension is required, hook the rear end of the counterbalance spring in the next hole of the spring bracket nearer the shoulder screw over which the bracket is placed. If less spring tension is required, hook the spring in the next hole in the bracket farther from the shoulder screw. Replace the front end of the spring on the elevator arm projection and measure as specified for the required spring tension.(See Figure 34 for location of parts.)

NOTE: The foregoing spring adjustment should permit the assembling elevator to return fully and quickly to its assembling position after the delivery of an assembled line, but without striking its lower stop with excessive force.

Selector Trip Arm Detent Spring Tension (Figure 37)

Rotate the elevator shaft to its stop position. Move the trip arm so it is detented in the lowest hole. Hold the selector clutch throw-out lever latch away from the rear extension of the selector trip arm and apply the push end of a 12 lb. scale to the upper edge of the trip arm above the detent holes and push vertically downward. It should require 3-1/2 to 6 lbs. to start the trip arm moving.

REPLACE THE DRIVING BELT.

Elevator Safety Spring Tension Adjustment (Figure 37)

NOTE: In order to check this adjustment it will be necessary to remake it. If this adjustment must be remade, the slug line casting machine should be properly conditioned to receive blank lines; that is, lines containing neither matrices or space bands.

NOTE: After making a single adjustment, check related adjustments.

Place a piece of tape containing a series of elevator signals in the selector of the operating unit. Single elevator signals may be sent through the selector by turning the operating unit manual control lever clockwise to the start position and quickly turning it to the stop position by turning it counterclockwise.

If necessary, decrease the safety spring tension by means of the safety spring adjusting screw (see Notes A and B) until the elevator just fails to release the transfer delivery carriage. Then slowly increase the spring tension by turning the adjusting screw one-quarter turn at a time in the proper direction (see Notes A and B) until the elevator just releases the transfer delivery carriage. (Test by running elevator signals through the unit after each change in adjustment of the screw.) Then give the elevator safety spring adjusting screw one turn additional in the direction it was last rotated. Check the safety spring tension after it has been adjusted by hooking a 12 lb. scale on the elevator front plate and pulling downward. It should require 3-1/2 to 4-1/2 lbs. to prevent the elevator from rising when an elevator signal is sent through. Against a 3 pound pull, the elevator should start to rise.

NOTE A: On elevator handles having the safety spring adjusting screw flush with the outer surface of the safety spring plug (Figure 37-A), the safety spring tension is decreased by turning the safety spring adjusting screw clockwise. To increase the spring tension, the screw should be turned counterclockwise.

NOTE B: On elevator handles having the safety plug counterbored for the safety spring adjusting screw, as shown in Figure 37-B, the safety spring tension is decreased by turning the safety spring adjusting screw counterclockwise. To increase the spring tension, the screw should be turned clockwise.

Delivery Slide Fork Adjustment (Figure 38-A)

When the delivery slide is released and permitted to move to its left position, there should be a clearance of .020" to .040" between the left edge of the delivery slide fork and the right hanger.

To adjust, position the delivery slide fork on the delivery slide bar by means of its clamping screws and elongated holes.

Delivery Slide Fork Floating Lever Eccentric Adjustment (Figure 38-B)

With the delivery slide and the elevator bell crank latching link moved to their right (latched) positions, there should be a clearance of .020" to .040" between the top of the elevator clutch throw-out lever and the outer shoulder of the throw-out lever latch.

To adjust, position the eccentric on the floating lever by means of its clamping screw to obtain the required clearance.

Delivery Slide Bar Spring Tension (Figure 38-A)

With the delivery slide bar in its left position, hook a 32 oz. scale over the fork and pull horizontally to the right. It should require 18 to 24 ozs. to start the delivery slide bar moving.

Lower Rail Push Bar Lever Screw Adjustment (Figure 39)

With the lateral rail manual lever in its rear detent position, there should be a clearance of .010" to .020" between the lower rail push bar lever adjusting screw and the end of the lower operating link.

To obtain this clearance, adjust the lower rail push bar lever adjusting screw.

Upper Rail Push Bar Lever Screw Adjustment (Figure 39)

With the lateral rail manual lever in its front detent position, the upper rail push bar lever adjusting screw should clear the end of the upper operating link by .010" to .020".

NOTE: After making a single adjustment, check related adjustments.

To obtain this clearance, adjust the upper rail push bar lever adjusting screw.

Lateral Rail Manual Lever Detent Spring Tension (Figure 39)

With the lateral rail manual lever in its rear detent position, apply the push end of a 12 lb. scale in the hollow of the front detent notch. It should require 1-3/4 to 2-1/4 lbs. to start the detent moving.

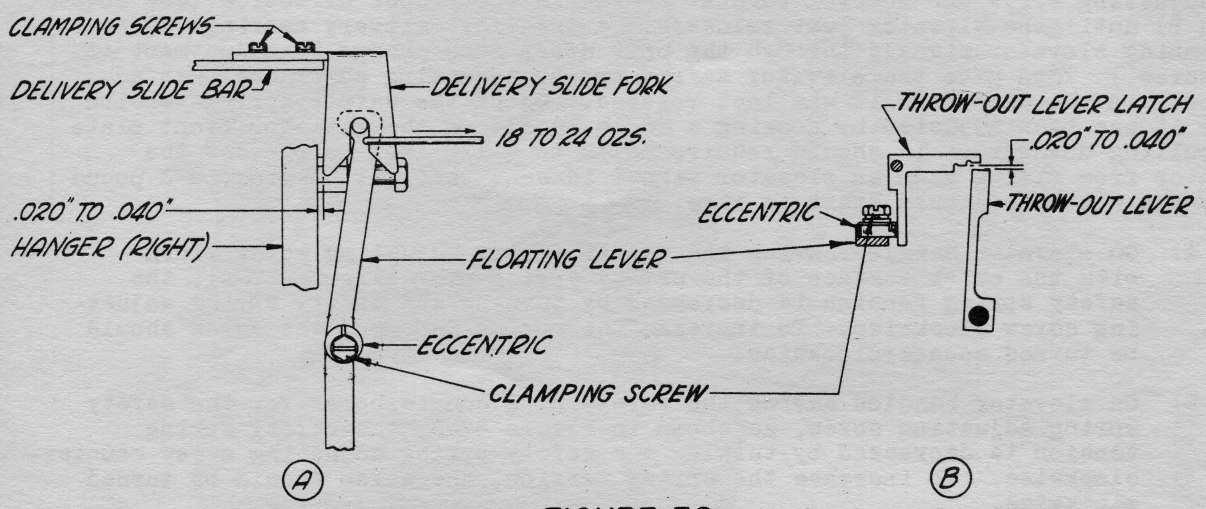


FIGURE 38

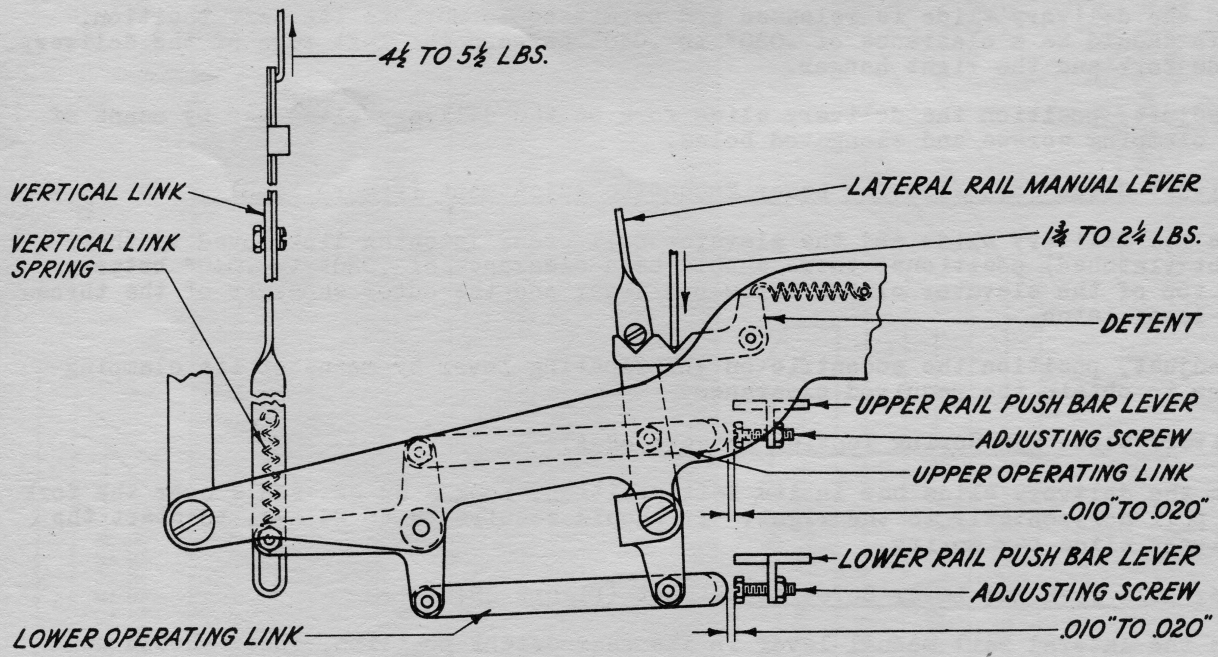


FIGURE 39

NOTE: After making a single adjustment, check related adjustments.

Vertical Link Spring Tension (Figure 39 and 40)

Detach the upper end of the vertical link from the lateral rail actuating lever. Hook a 12 lb. scale in the hole at the upper end of the link and pull vertically upward while holding the lateral rail manual lever firmly to the rear. It should require 4-1/2 to 5-1/2 lbs. to start the link moving. Reconnect the vertical link.

Lateral Rail Cap Adjustment (Figure 40-A)

The inner surface of the lateral rail cap should be flush with the inner surface of the assembling elevator front plate (casting) and the right end of the rail cap should clear the assembling elevator gate by not more than .004".

To adjust, position the lateral rail cap by means of its mounting screws and enlarged mounting holes.

Lateral Rail Stop Screw Adjustment (Figure 40-B)

With the lateral rail held against its stop screw, the hook at the right end of the lateral rail should clear the chute rail by not more than .004".

Adjust the lateral rail stop screw to obtain this clearance.

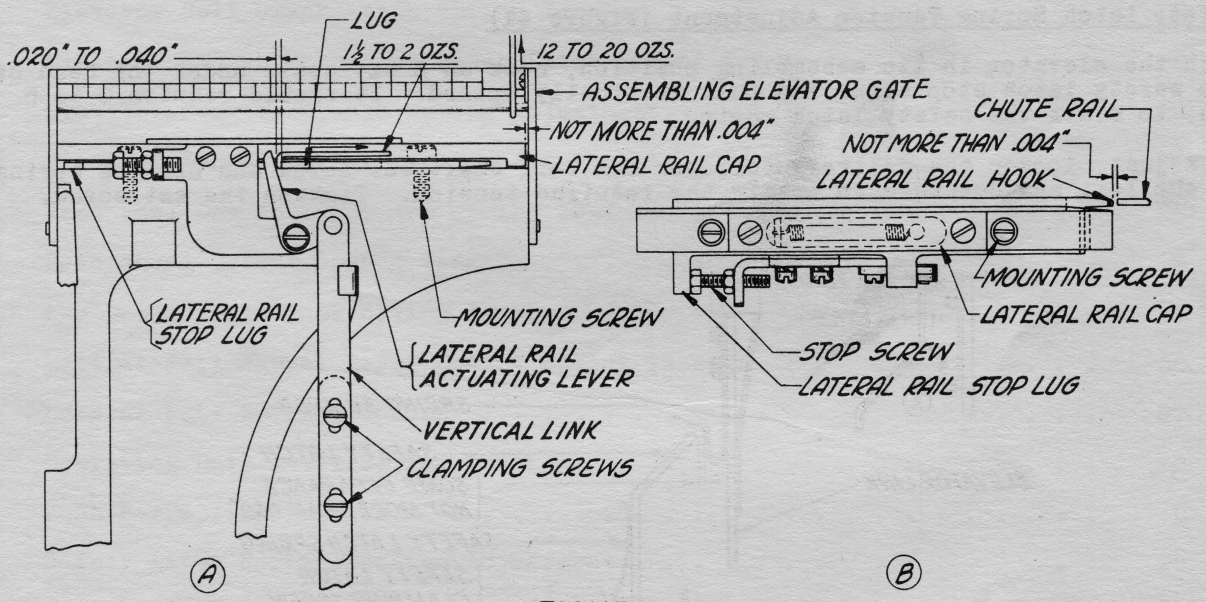


FIGURE 40

Vertical Link Adjustment (Figure 40-A)

With the lateral rail manual lever in its forward detent position, there should be .020" to .040" clearance between the lateral rail actuating lever and the spring lug on the lateral rail.

To obtain this clearance, adjust the length of the vertical link by means of the clamping screws and elongated holes.

NOTE: After this adjustment has been checked, move the lateral rail lever to its rear detent position. The lateral rail stop lug should be firmly against the stop screw (Figure 40-B).

Lateral Rail Spring Tension (Figure 40-A)

With the lateral rail in its unoperated (Left) position, hook an 8 oz. scale over

NOTE: After making a single adjustment, check related adjustments.

the spring lug on the lateral rail, opposite the spring hole, and pull horizontally to the right. It should require 1-1/2 to 2 ozs. to start the rail moving.

Delivery Slide Arm Follower Adjustment

Rotate the elevator shaft to its stop position. Move the delivery slide to its left position and the elevator bell crank latching link to its latched (right) position. Move the delivery slide slowly to the right. The elevator clutch throw-out lever should be released when the delivery slide is 2-1/4" to 1-3/4" from its right-hand stop.

Adjust the delivery slide follower by means of the elongated hole and clamping screw to meet this requirement.

Elevator Safety Latch Stop Screw Adjustment (Figure 41)

With the delivery slide in its right position, hold the elevator so that the upper left edge of the safety latch will be opposite the vertical edge of the spring bumper below the stopping shoulder but not touching the spring bumper. Under these conditions there should be some clearance, not more than .030", between the upper left edge of the safety latch and the vertical edge of the spring bumper, directly below the stopping shoulder.

Adjust the safety latch stop screw to obtain the required clearance.

Safety Latch Spring Tension Adjustment (Figure 41)

With the elevator in its assembling position, hook an 8 oz. scale under the head of the safety latch stop screw and pull vertically upward. It should require 3 to 5 ozs. to start the safety latch moving.

To adjust, loosen the delivery follower cam bail shaft set screw and bow the spring to the left and downward to obtain the required tension. Tighten the set screw.

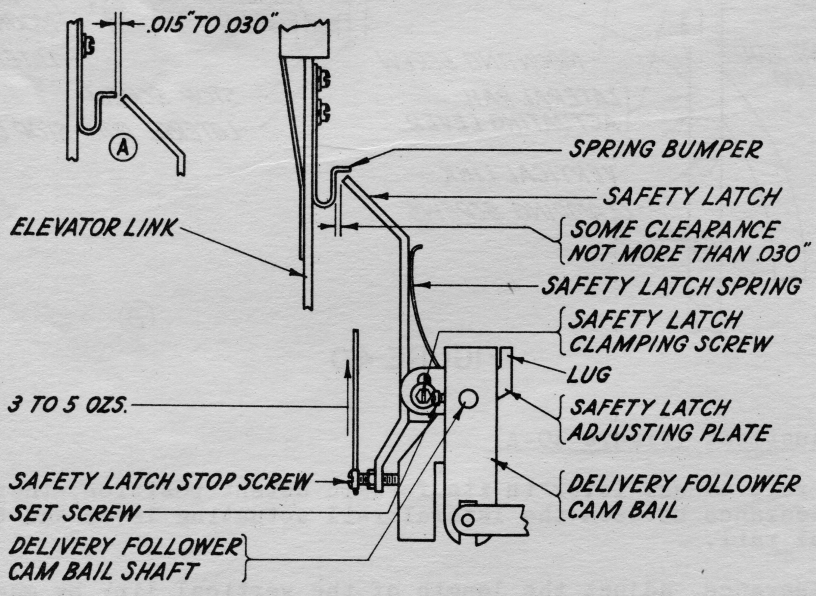


FIGURE 41

Safety Latch Adjustment (Figure 41-A)

With the delivery slide in its left position and the elevator held so that the tip of the spring bumper is opposite the safety latch, there should be .015" to .030"

NOTE: After making a single adjustment, check related adjustments.

clearance between the upper left edge of the safety latch and the tip of the spring bumper.

To adjust, position the safety latch by means of its clamping screw to obtain the required clearance.

REPLACE THE THREE COVERS.

LUBRICATION SPECIFICATION

The oil and grease specified in the supplement furnished with this bulletin should be used to lubricate the operating unit and accessories.

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 below, except where the use of grease or powdered graphite is specified.

Oil both loops of all helical springs that exert a nominal tension of less than 2-1/2 pounds.

Apply grease to both loops of all helical springs that exert a nominal tension of 2-1/2 pounds or more.

1. Tape retaining lid bearing - two places.
2. Tape retaining lid latch.
3. Top plate bearings - two.
4. Selector levers bearing shaft - six places.
5. Selector levers bail - two places.
6. Selector levers bail cam roller bearing.
7. "T" transfer levers bearing shaft - six places.
8. Transfer bail bearings - two oil holes.
9. Transfer bail cam roller bearing.
10. Tape feed roll bearings - two.
11. Tape feed pawl bearing.
12. Tape feed lever bearings.
13. Feed pawl cam follower arm roller bearing.
14. Delay ratchet shaft bearing.
15. Delay feed ratchet - oil teeth sparingly.
16. Delay retaining ratchet - oil teeth sparingly.
17. Delay retaining pawl bearing.
18. Delay push bail bearings.
19. Delay feed pawl bearing.
20. Delay feed pawl operating lever bearings.
21. Delay bail bearings.
22. Delay bail rollers.
23. Code bar links at guide blocks.
24. Code bar links detent - four pivot screws.
25. Operating shaft right end bearing - fill oil cup.
26. Driving shaft (pulley shaft) bearings - fill two oil cups.
27. Selector shaft bearings - fill oil cup and hole.
28. Elevator shaft bearings - fill oil cup and hole.
29. Elevator and selector shaft clutches - remove oil retaining nuts and fill shafts with oil.
30. Clutch throw-out lever shafts - fill oil cups at front ends of each.
31. Elevator clutch throw-out lever reset cam roller bearing.
32. Clutch detent levers bearings.
33. Clutch detent levers cam roller bearings.
34. Clutch throw-out lever latches bearing screws - two places on each.
35. Manual tape feed control shaft bearings - two.
36. Manual tape feed control detent plunger.
37. Manual tape feed cam roller bearing.
38. Selector clutch throw-out lever bail link bearings - two.
39. Elevator bell crank pivot screw.
40. Elevator bell crank latching link pivot screw and guide.
41. Elevator bell crank latch pivot screw.
42. Floating lever pivot screw.
43. Push bar operating bail levers pivot screws - two.
44. Spreader cam - saturate oiler felt with oil.
45. Spreader cam bearings - fill two oil holes.
46. Code bars at guide blocks.
47. Key lever bell cranks - remove and wipe with cloth dampened slightly with oil.
48. Push bars - oil sparingly at fulcrum rod.
49. Shift bell crank pivot screw.

50. Shift link pivot screws - two.
51. Shift latch pivot screw.
52. Yield and shift levers pivot screw.
53. Duplex rail accessories pivot screws.
54. Cams - apply thin film of grease.
55. Gears - apply thin film of grease.
56. Delivery slide follower - bearing and at point of contact with the bail.
57. Elevator arm shaft bearings - oil hole in each bearing.
58. Elevator cam roller casting - two oil holes.
59. Safety plunger - oil hole in elevator handle.
60. Selector trip arm bearing.
61. Duplex rail bell crank bearing screw.
62. Upper operating link - two bearing screws.
63. Lower operating link - two bearing screws.
64. Duplex rail manual lever - bearing screw, detent roller bearing screw and detent bearing screw.
65. Lateral rails - clean and lubricate with powdered graphite.
66. Lock slide cam - apply a thin film of grease.