28E AND 28H TRANSMITTER DISTRIBUTOR UNIT

ADJUSTMENTS

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Prepared for American Telephone and Telegraph Company by Teletype Corporation

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1. GENERAL

1.01 This section provides specific adjustments for the 5-level 28E and 28H transmitter distributor. This section is reissued to add recent engineering changes and additions, and to rearrange the order of adjustments. Arrows in the margin indicate changes and additions.

1.02 The adjustments are arranged in a sequence that should be followed if a complete readjustment is undertaken. The tools and spring scales required to perform these adjustments are found in tool Section 570-005-800. A complete adjusting procedure should be read before attempting to make the adjustment. After an adjustment is completed, be sure to tighten any nuts or screws that may have been loosened. Where an illustration shows interrelated parts, the sequence that should be followed in checking the requirements and making the adjustments is indicated by the letters, (A), (B), (C), etc.

1.03 The adjusting illustrations indicate tolerances, positions of moving parts, spring tensions, and the angle at which scales should be applied. Coil springs which do not meet the requirements, and for which there are no adjusting procedures, should be discarded and replaced with new springs. If a part mounted on shims is removed, the number of shims used at each mounting screw should be noted so that the same number is replaced when the part is remounted.

Note: Remove power from unit before making adjustments.

1.04 When the requirement calls for the clutch to be disengaged, the clutch shoe lever must be fully latched between its trip lever and latchlever so that the clutch shoes release their tension on the clutch drum. When engaged, the clutch shoe lever is unlatched and the clutch shoes are wedged firmly against the clutch drum. When the main shaft is rotated by hand, the clutch does not fully disengage upon reaching its stop position. In order to relieve the drag on the clutch and permit the main shaft to rotate freely, apply pressure on a lug of the clutch disc with a screwdriver to cause it to engage its latchlever and thus disengage the internal expansion clutch shoes from the clutch drum.

Note 1: After a few weeks (300 to 500 hours) of operation of a new unit, the unit should be relubricated to make sure all operating points have been properly lubricated.

Note 2: Recheck all clutch gaps to insure that the parts, after seating themselves, have not caused the clutch gaps to open up. Reset if necessary. Standard readjustment periods are to be maintained thereafter.

1.05 The covers may be removed for inspection and minor repair of the unit; however, when more extensive maintenance is to be undertaken, it is recommended that the unit be disconnected from its source of power as a safety precaution.

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

1.07 All electrical contact points should meet squarely. Contacts with the same diameter should not be out of alignment more than 25 percent of the contact diameter. Check contacts for pitting and corrosion and clean or burnish them before making specified adjustment or tolerance measurement. Avoid sharp kinks or bends in the contact springs.

CAUTION: KEEP ALL ELECTRICAL CONTACTS FREE OF OIL AND GREASE.

1.08 Units may have signal contacts made of either unplated or gold-plated tungsten. If in doubt as to the type of contacts, remove contact box cover and inspect contacts for gold plating. Do not use burnishers, files, etc which will remove gold plating.

1.09 Use twill jean cloth (KS2423) (TP107162) to clean gold-plated contacts. Open contacts. Allow contacts to close on surface of twill jean. Draw twill jean part way through. Open contacts and withdraw twill jean.

1.10 This procedure prevents small fibers at edges of twill jean strip from becoming lodged between contacts.

1.11 Clean unplated tungsten contacts in accordance with standard procedures (Paragraph 1.07).

Servicing For Certain Low-Voltage Applications

1.12 For standard applications, including those with data sets, observe standard maintenance procedures and intervals. Certain low-voltage applications are covered below.

1.13 For optimum reliable operation in these low-voltage applications, clean gold-plated contacts with twill jean, as instructed above, at intervals of approximately 50 hours of actual contact operation. Since maintenance interval and life expectancy of the contacts are dependent on the signal circuit, maintenance interval may be lengthened for specific applications.

Note 1: Applying operating voltage of standard Distortion Test Set directly to contacts may damage gold plating and impair low-voltage operation. When electrically adjusting or testing contacts (2.22), use an intermediate device, keyed by the contacts, to interrupt current to stroboscopic lamp of test set. This intermediate device must be capable of being keyed by a 3 to 20 volt change at maximum of 20 milliamperes.

Note 2: Normally for low-voltage applications, contacts should be used in circuits operating between 3 and 20 volts dc at a current level not to exceed 60 milliamperes. Between 20 and 70 volts dc the current should be adjusted so as not to exceed a 120 milliwatt power level. The contacts are not normally intended for use with voltages above 70 volts dc. Exceeding this level for an appreciable length of time may result in damage to the gold plating and make them unfit for low-voltage applications.

2. BASIC UNITS

2.01 Clutch Mechanism

Note 1: Remove the transmitter distributor from its base before making a complete re-adjustment or spring tension checks.

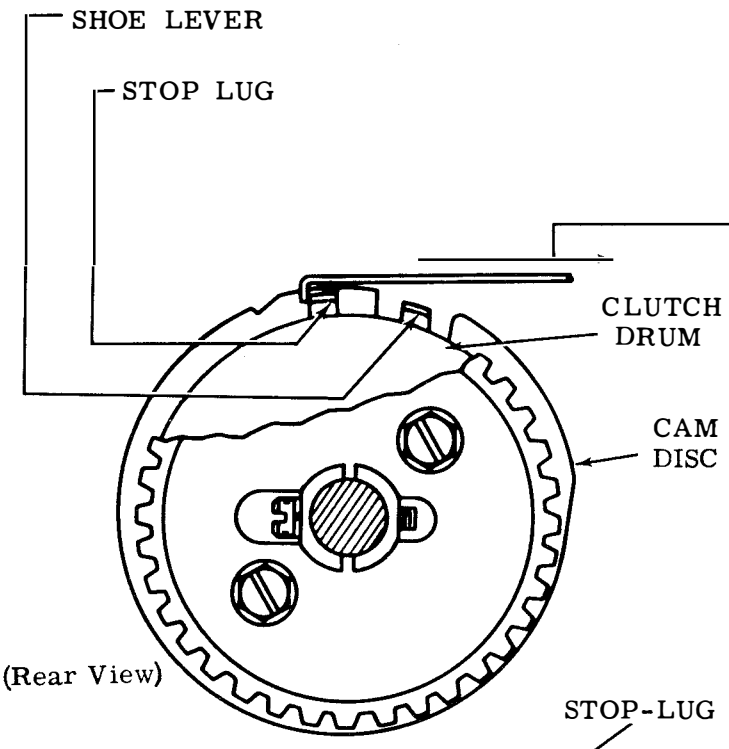
Note 2: Adjustments (A) and (B) are made at the factory and should not be disturbed unless good reasons exist that the requirements are not met.

(A) CLUTCH SHOE LEVER SPRING

To Check
Invert unit and rotate main shaft until clutch shoe lever and stop lug are up. With clutch engaged, hold cam disc to prevent turning.

Requirement
Min 15 oz---Max 20 oz
to move shoe lever in contact with stop lug.

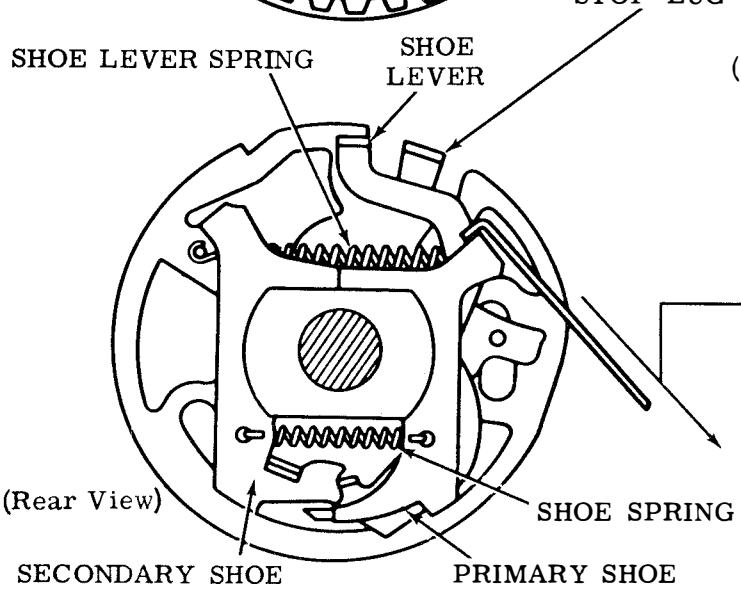
(Where set is equipped with tape slack mechanism)
Min 9 oz---Max 11 oz



(B) CLUTCH SHOE SPRING

To Check
Remove the clutch from the main shaft. With the clutch drum removed, hook spring scale as shown.

Requirement
Min 3 oz---Max 5 oz
to start primary shoe moving away from secondary shoe at point of contact.



2.02 Clutch Mechanism (continued)

Note: Remove transmitter distributor from base before making adjustments.

CLUTCH SHOE LEVER

To Check

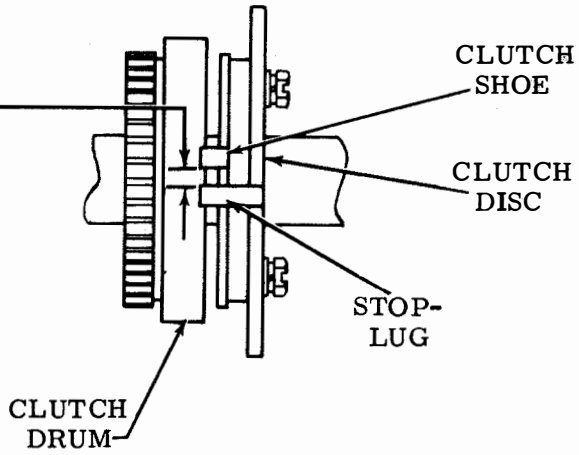
Trip transmitter distributor clutch. Pull shoe lever opposite the stop-lug with a force of 32 oz. Release the force slowly to engage clutch shoes. Note clearance between clutch shoe lever and stop-lug. Disengage the clutch, and again pull the lever opposite the stop-lug with a force of 32 oz. Release the force slowly. Note clearance between the shoe lever and the stop-lug.

Requirement

Min 0.055 inch---Max 0.085 inch greater clearance with clutch engaged than with clutch disengaged.

To Adjust

Loosen clutch disc clampscrews. Place wrench over stop-lug and move disc. Retighten screws.



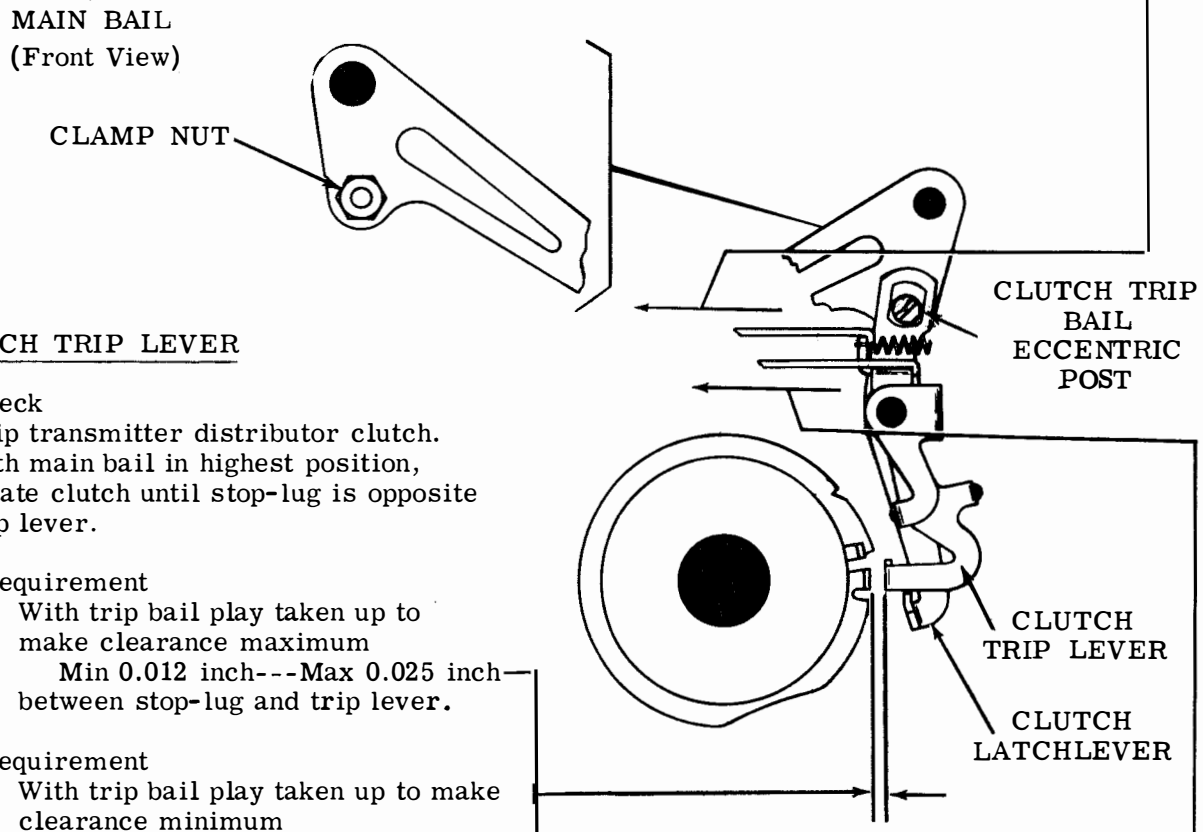
(Left Side View)

2.03 Clutch Mechanism (continued)

(C) CLUTCH LATCHLEVER SPRING

To Check
Trip clutch and rotate until latchlever is on low part of disc.

Requirement
Min 3 oz---Max 5-1/2 oz
to start clutch latchlever moving.



(A) CLUTCH TRIP LEVER

To Check
Trip transmitter distributor clutch. With main bail in highest position, rotate clutch until stop-lug is opposite trip lever.

(1) Requirement
With trip bail play taken up to make clearance maximum
Min 0.012 inch---Max 0.025 inch
between stop-lug and trip lever.

(2) Requirement
With trip bail play taken up to make clearance minimum
some clearance
between stop-lug and trip lever.

To Adjust
Loosen clamp nut friction tight and rotate trip bail eccentric post. Check Requirement (1). Retighten clamp-screw.

(B) CLUTCH TRIP LEVER SPRING

Requirement
With clutch engaged
Min 7 oz---Max 10-1/2 oz
to start clutch trip lever moving.

2.04 Tape Lid

TAPE LID

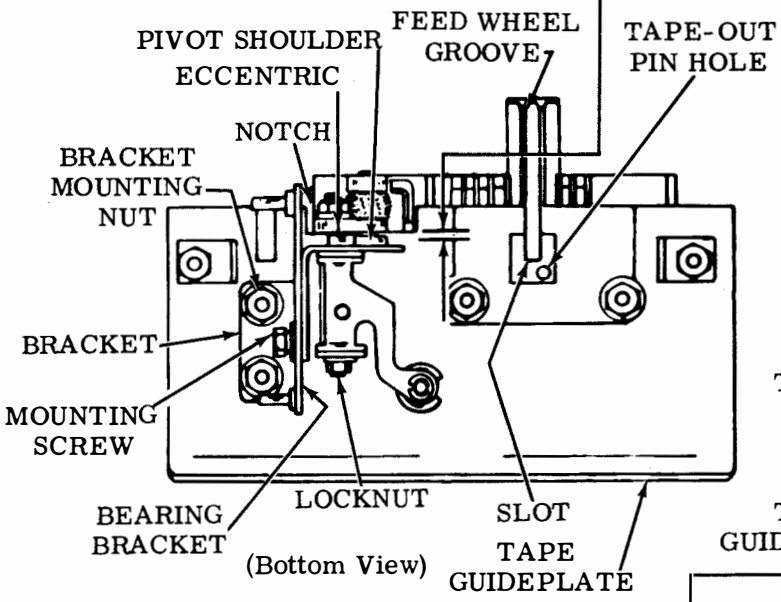
To Check

Remove top plate and tape guideplate. Lubricate before adjustment.

(1) Requirement

With tape lid held against notch in tape guideplate, feed wheel groove lined up with slot in tape guideplate, and tape-out pin holes lined up

Min some---Max 0.010 inch between tape lid and pivot shoulder.



To Adjust

Loosen bracket mounting nuts. Insert tip of appropriate gauge (Note 1) through slot in tape guideplate and into feed wheel groove. Position bracket. Tighten nuts.

Note 1: Use one of the following three gauges in making this adjustment:

TAPE	GAUGE
5-Level	TP156743
6-Level	TP170311 (In-Line Feed Hole)
6-Level	TP173503 (Advance Feed Hole)

(2) Requirement

With front bearing surface of tape lid touching tape guideplate

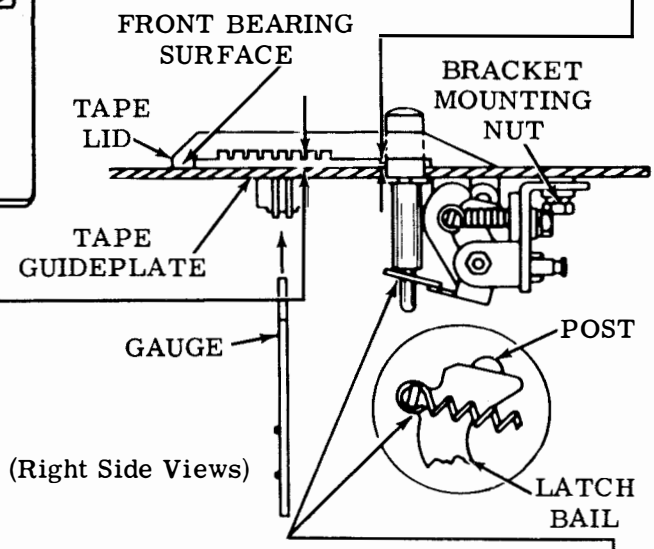
Min 0.010 inch---Max 0.018 inch between fin indicated and tape guideplate.

To Adjust

Loosen bearing bracket mounting screws. While pressing tape lid against tape guideplate, position bearing bracket. Recheck Requirement (1).

Note 2: If Requirement (2) cannot be met, position bearing bracket so that its mounting screws are located in centers of holes in bracket. Repeat Requirements (1) and (2).

Note 3: When tape guideplate and top plate are assembled to reader, tape lid may touch top plate, and a different clearance from that specified in Requirement (2) can be expected. However, with tape lid closed, there must always be at least 0.002 inch clearance between tape guideplate and heel pad.



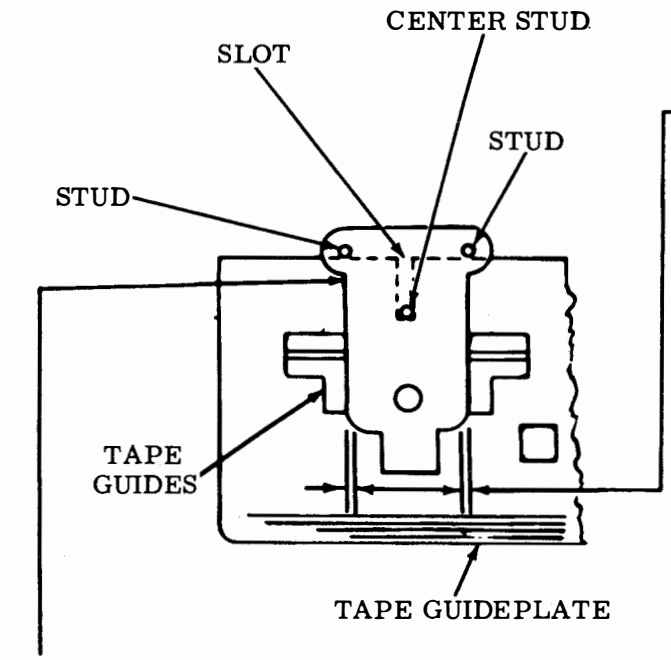
(3) Requirement

With tape lid latched against tape guideplate, release plunger must have some endplay.

To Adjust

Loosen locknut. Raise tape lid and rotate high part of eccentric towards bearing bracket. Close tape lid and continue rotating high part of eccentric towards bearing bracket until latch bail just falls under flat on post. Recheck operation of latch bail by depressing release plunger with tape lid held down.

2.05 Tape Lid (continued)



(Top View)

TAPE GUIDE

To Check

Unlatch tape lid and position gauge as illustrated.

(1) Requirement

Min some---Max 0.003 inch between gauge and each tape guide.

(2) Requirement

Edge of wear plate flush with edge of tape guideplate.

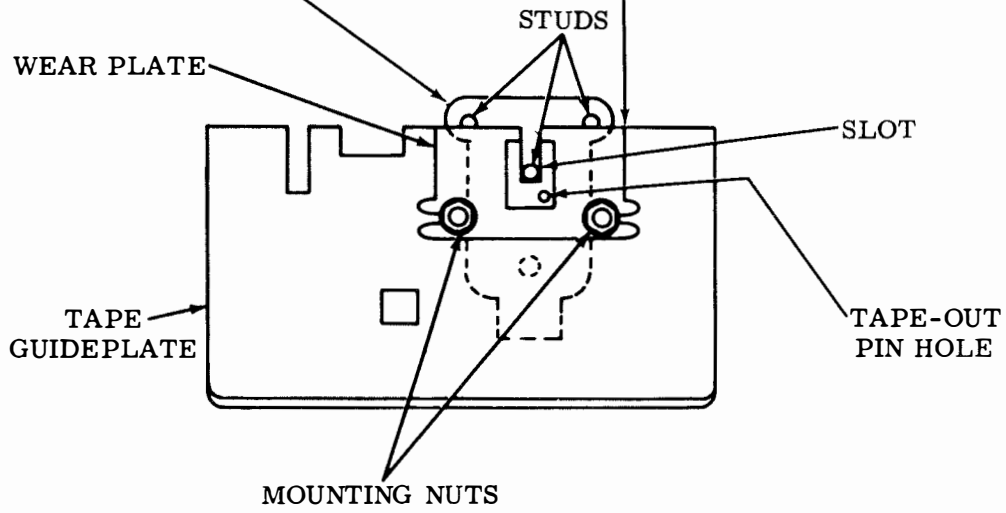
(3) Requirement

Tape must not ride up the sides of the tape guides.

To Adjust

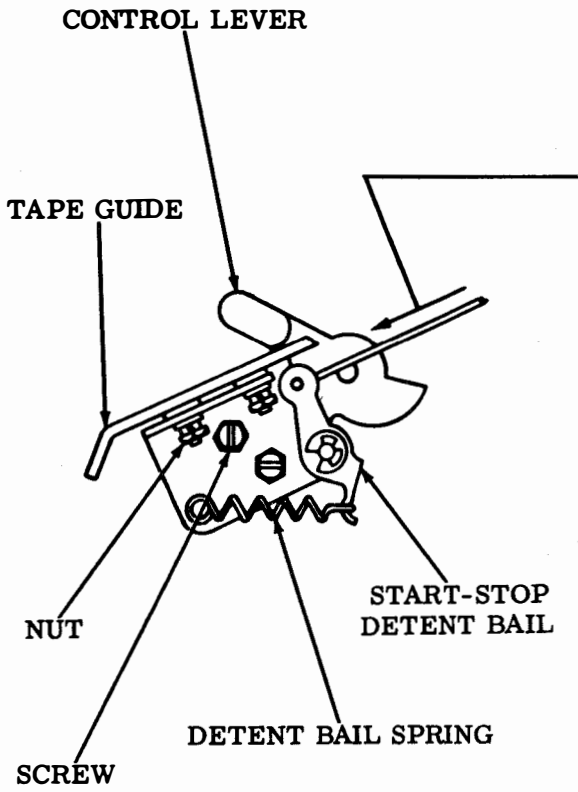
Loosen mounting nuts. Position wear plate until it overhangs tape guide-plate. Push gauge down until top two studs butt up against tape guideplate thus positioning edge of wear plate flush with edge of tape guideplate. Hold gauge and wear plate and position each tape guide to meet Requirement (1). Tighten mounting nuts.

Note: Tape guides may touch gauge, but they must not bind against gauge when it is removed.



(Bottom View)

2.06 Tape Lid (continued)



(Rear View)

(A) START-STOP DETENT BAIL SPRING

To Check
Place control lever in run position.

Requirement
Min 14 oz---Max 22 oz
to start detent bail moving away from control lever.

(B) TAPE LID RELEASE PLUNGER SPRING

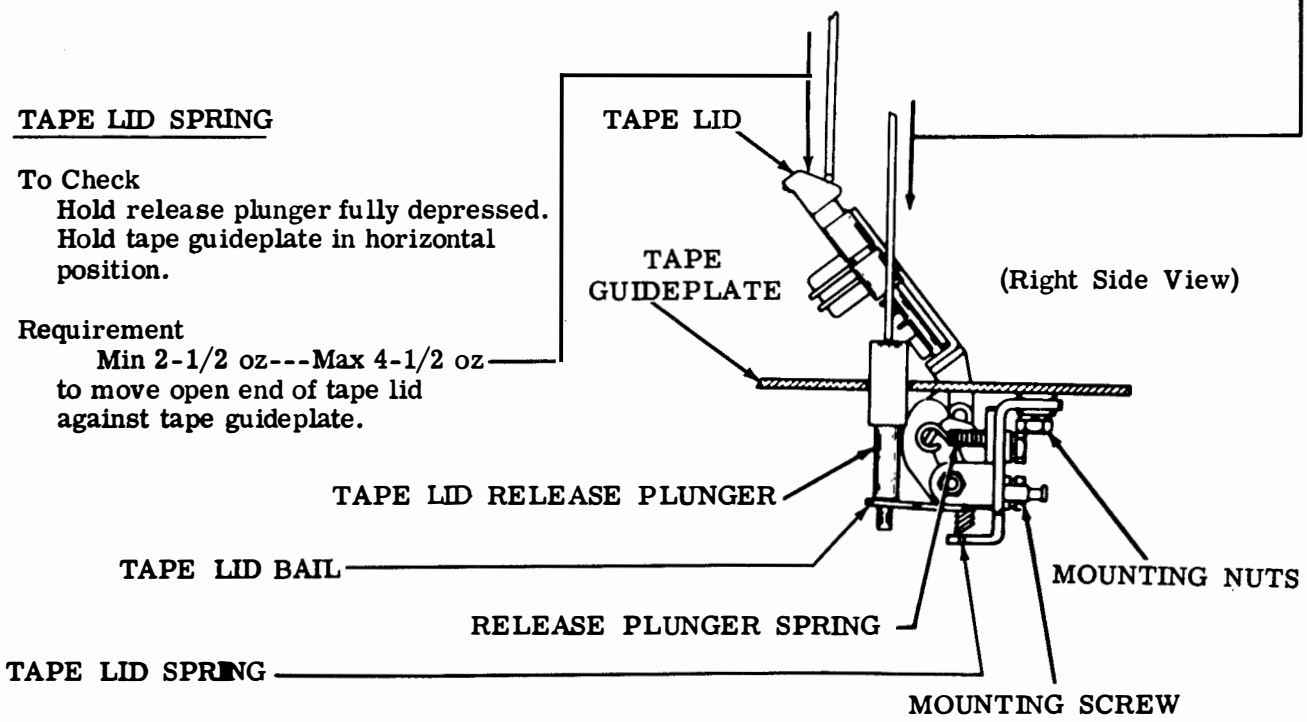
To Check
Unlatch tape lid. Place tape guideplate in a horizontal position and hold it there.

Requirement
Min 28 oz---Max 48 oz
to start tape lid bail moving.

(C) TAPE LID SPRING

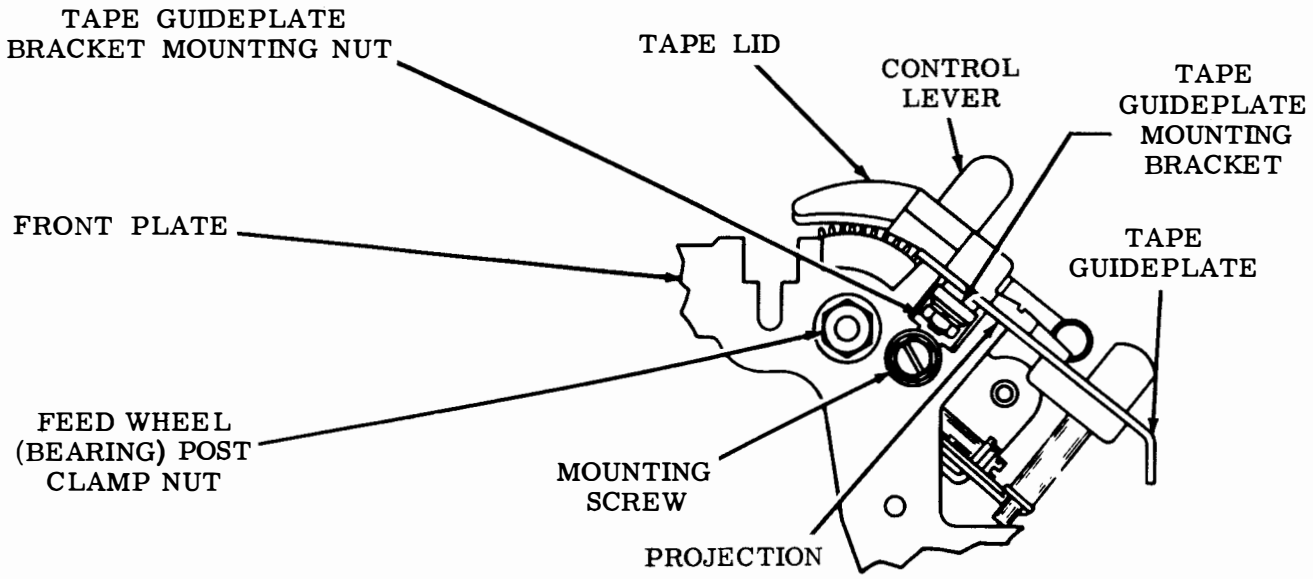
To Check
Hold release plunger fully depressed. Hold tape guideplate in horizontal position.

Requirement
Min 2-1/2 oz---Max 4-1/2 oz
to move open end of tape lid against tape guideplate.



(Right Side View)

2.07 Tape Lid (continued)



(Front View)

Note 1: To prevent damage to the tape-out pin, position stop arm to its lowest position and hold control lever bail extension from feed wheel ratchet.

TAPE GUIDEPLATE

(1) Requirement
Feed wheel post is not to interfere with mounting brackets of top plate and tape guideplate.

To Adjust
Loosen clamp nut and rotate feed wheel post.

(2) Requirement
Tape guideplate to rest firmly against a minimum of three of the four projections on side plates.

To Adjust
Rotate unit clutch to its stop position. Trip clutch to put sensing pins in their highest positions. Unlatch tape lid and place control lever to run position. Loosen mounting screws and mounting nuts. Position tape guideplate on reader to meet Requirement (2). Position tape-out pin into hole in tape guideplate. Tighten mounting screws.

Note 2: Mounting nuts loosened in Requirement (2) are tightened after performing Requirement (3) and TOP PLATE (2.08) adjustment.

(3) Requirement
Edge of tape guideplate to project over side plates by equal amounts as gauged by eye.

To Adjust
Position tape guideplate.

Note 3: Tight-tape bail extension must be under top plate.

2.08 Top Plate

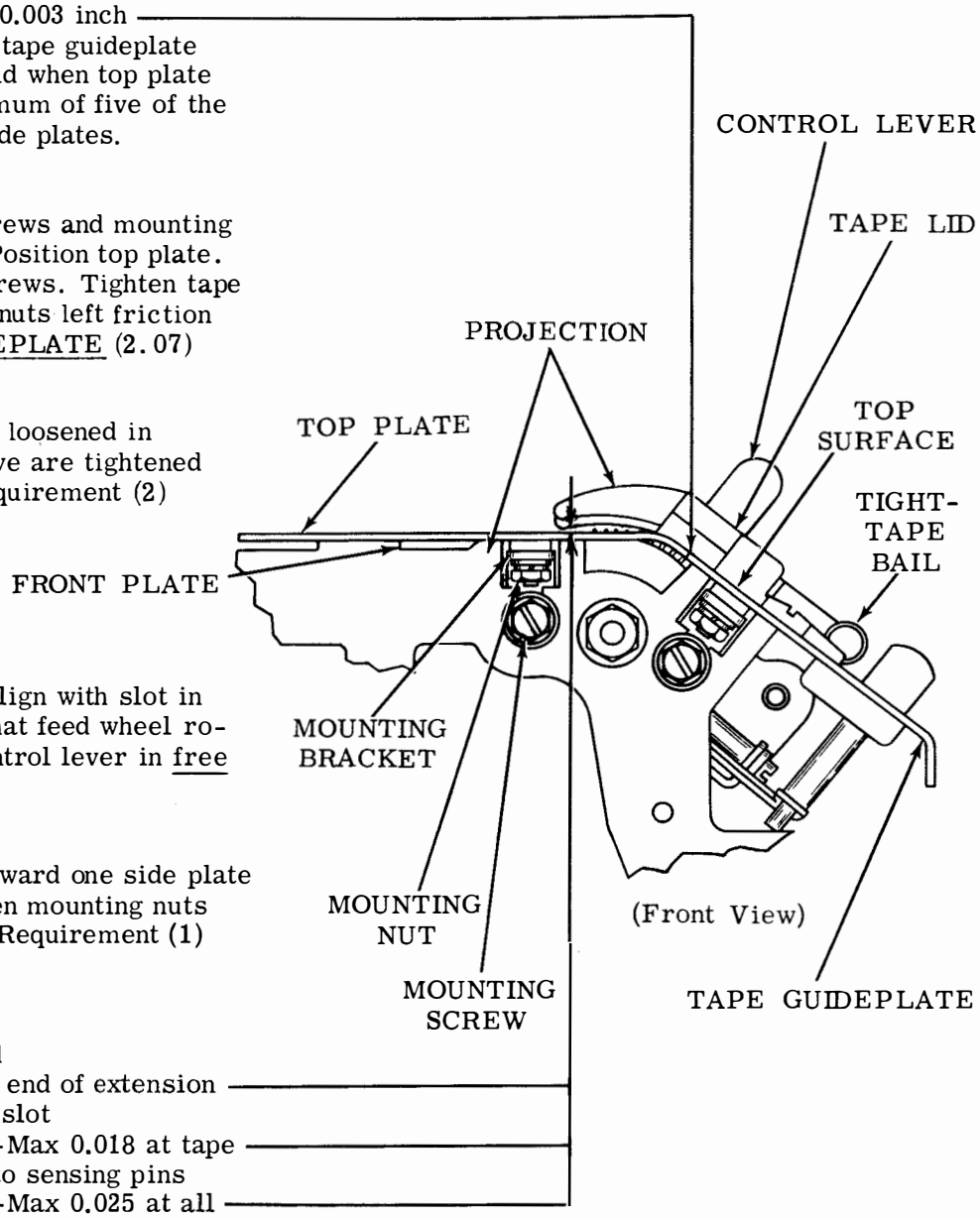
TOP PLATE

To Check
Remove cover plate and unlatch the tape lid.

(1) Requirement
Min flush---Max 0.003 inch below top surface of tape guideplate along width of tape lid when top plate is resting on a minimum of five of the six projections on side plates.

To Adjust
Loosen mounting screws and mounting nuts friction tight. Position top plate. Tighten mounting screws. Tighten tape guideplate mounting nuts left friction tight in TAPE GUIDEPLATE (2.07) adjustment.

Note: Mounting nuts loosened in Requirement (1) above are tightened after performing Requirement (2) below.



(2) Requirement
Feed wheel slot to align with slot in tape guideplate so that feed wheel rotates freely with control lever in free position.

To Adjust
Position top plate toward one side plate or the other. Tighten mounting nuts left friction tight in Requirement (1) above.

(3) Requirement
With tape lid latched
Min 0.010 inch at end of extension covering feed wheel slot
Min 0.010 inch---Max 0.018 at tape guideplate adjacent to sensing pins
Min 0.010 inch---Max 0.025 at all other areas
between tape lid projection and top plate with play taken up toward tape guideplate.

To Adjust
Loosen tape lid bearing bracket mounting screws. Position tape lid. Recheck TAPE LID (2.03) adjustment, Requirements (1) and (2).

2.09 Cover Plate

(A) COVER PLATE

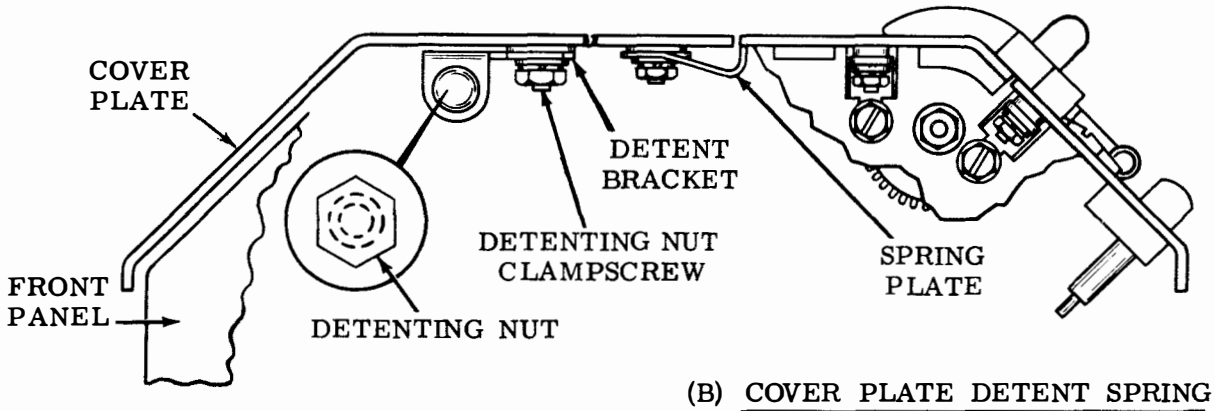
(1) Requirement
Right edge of cover plate holds flush against left edge of top plate by the cover plate detents.

(2) Requirement
Cover plate rests against at least three of the four projections (front and rear plate).

(3) Requirement
Front edge of cover plate and top plate align.

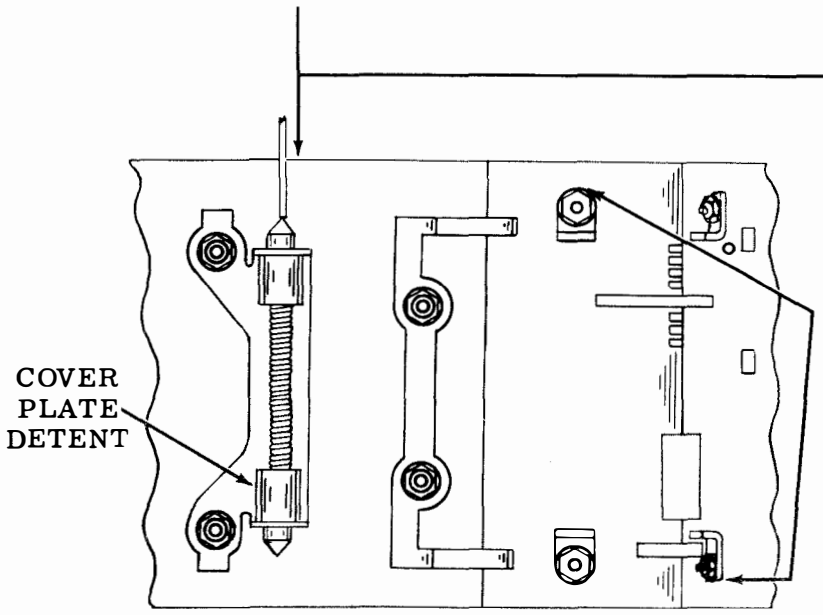
To Adjust
With detenting nut clampscrew (front and rear plate) friction tight, move clampscrews to their extreme lower right position, then tighten screws. Loosen detent bracket and spring plate mounting nuts. Place cover on unit and position horizontally to meet requirements. Retighten mounting nuts.

(Front View)



(B) COVER PLATE DETENT SPRING

Requirement
With spring scale applied to center of one detent
Min 28 oz---Max 48 oz
to start plunger moving.



Note: Outer edge of each mounting bracket should be approximately in line with shoulder of its mounting stud. Replace tape guideplate, tape-out tension spring, top plate, and cover plate.

(Bottom View)

2.10 Tape-Out Switch Assembly

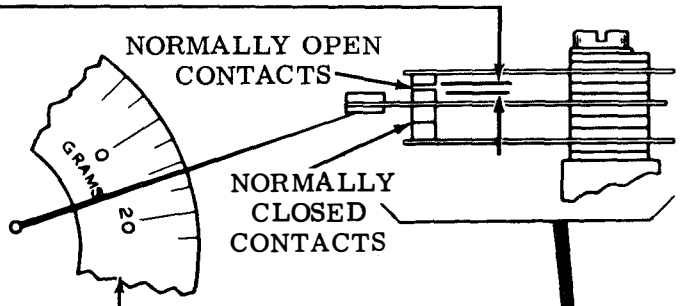
(A) TAPE-OUT CONTACT ASSEMBLY

To Check
Loosen spring bracket and move downward until tape-out pin extension no longer touches insulation on contact swinger.

(1) Requirement
Min 8 grams---Max 15 grams to separate normally closed contacts.

(2) Requirement
Min 0.008 inch---Max 0.015 inch between normally open contacts.

To Adjust
Remove tape-out contact assembly from unit by unhooking tape-out pin spring and removing bracket mounting screws. Form contact swinger using TP110445 spring bender. Replace contact assembly with swinger over tape-out pin extension. Place spring bracket shoulder bushing on upper hole and the washer on lower mounting hole. Rehook tape-out pin spring.



(B) TAPE-OUT SENSING PIN SPRING

To Check
Place control lever in run position.

Requirement
Min 38 grams---Max 45 grams to move tape-out pin to a position flush with tape guideplate.

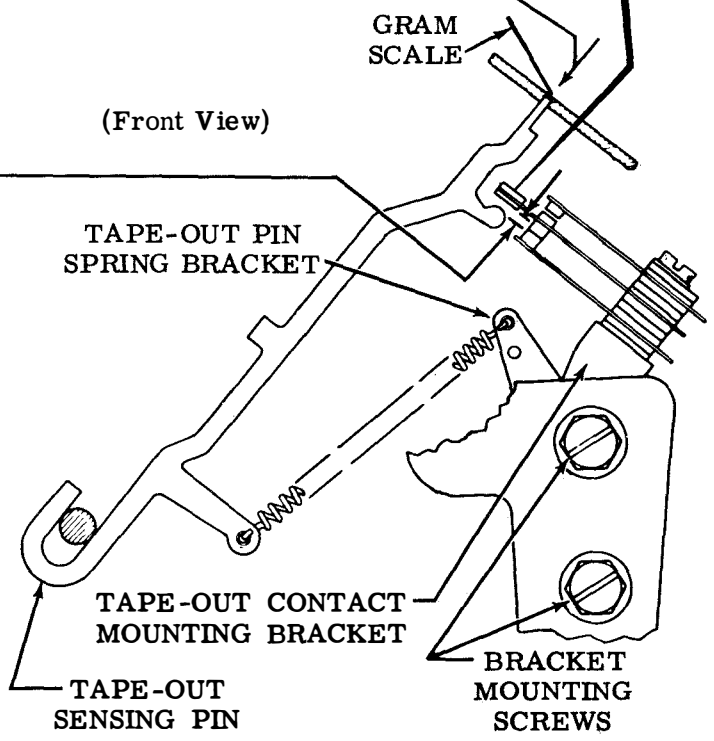
To Adjust
Loosen lower bracket mounting screw and position spring bracket to meet requirement. Retighten bracket mounting screw.

(C) TAPE-OUT CONTACT BRACKET

To Check
Insert tape under tape lid to hold tape-out pin down.

Requirement
Min 0.006 inch---Max 0.020 inch between tape-out pin upper extension and underside of insulation on swinger contact.

To Adjust
Loosen bracket mounting screws and adjust bracket. Retighten mounting bracket screws.



2.11 Tape-Out Switch Assembly (continued)

(B) DEPRESSOR BAIL TORSION SPRING

To Check
Place control lever in stop position. Unhook one end of intermediate tape-out bail spring.

Requirement
Min 2-3/4 oz---Max 5-1/2 oz to start tape-out bail moving away from tape-out pin depressor bail.

(C) INTERMEDIATE TAPE-OUT BAIL SPRING

To Check
Place control lever in run position. Unhook intermediate tape-out bail spring at post end.

Requirement
Min 3 oz---Max 5 oz to pull intermediate tape-out bail spring to its installed length.

(A) TAPE-OUT SENSING PIN

(1) To Check
Place control lever in stop position.

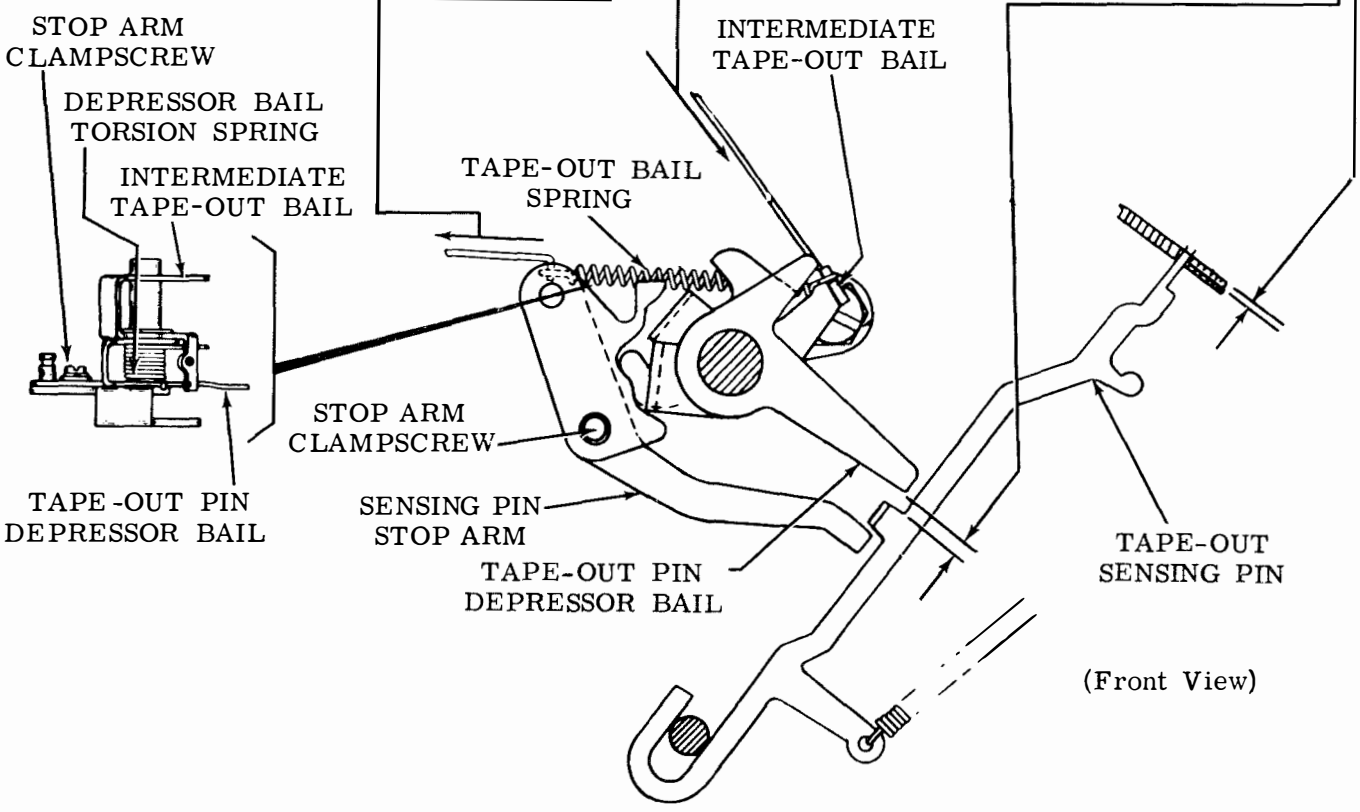
Requirement
Top of pin to be
Min flush---Max 0.010 inch below surface of tape guideplate.

To Adjust
Loosen stop arm clampscrew. friction tight. Position stop arm to meet requirement. Retighten clampscrew.

(2) To Check
Place control lever in run position.

Requirement
Clearance as shown should be
Min 0.055 inch

To Adjust
Loosen tape-out bail clampscrew. Position extension arm to meet requirement. Retighten clamp screw. Recheck requirement under (1) To Check.



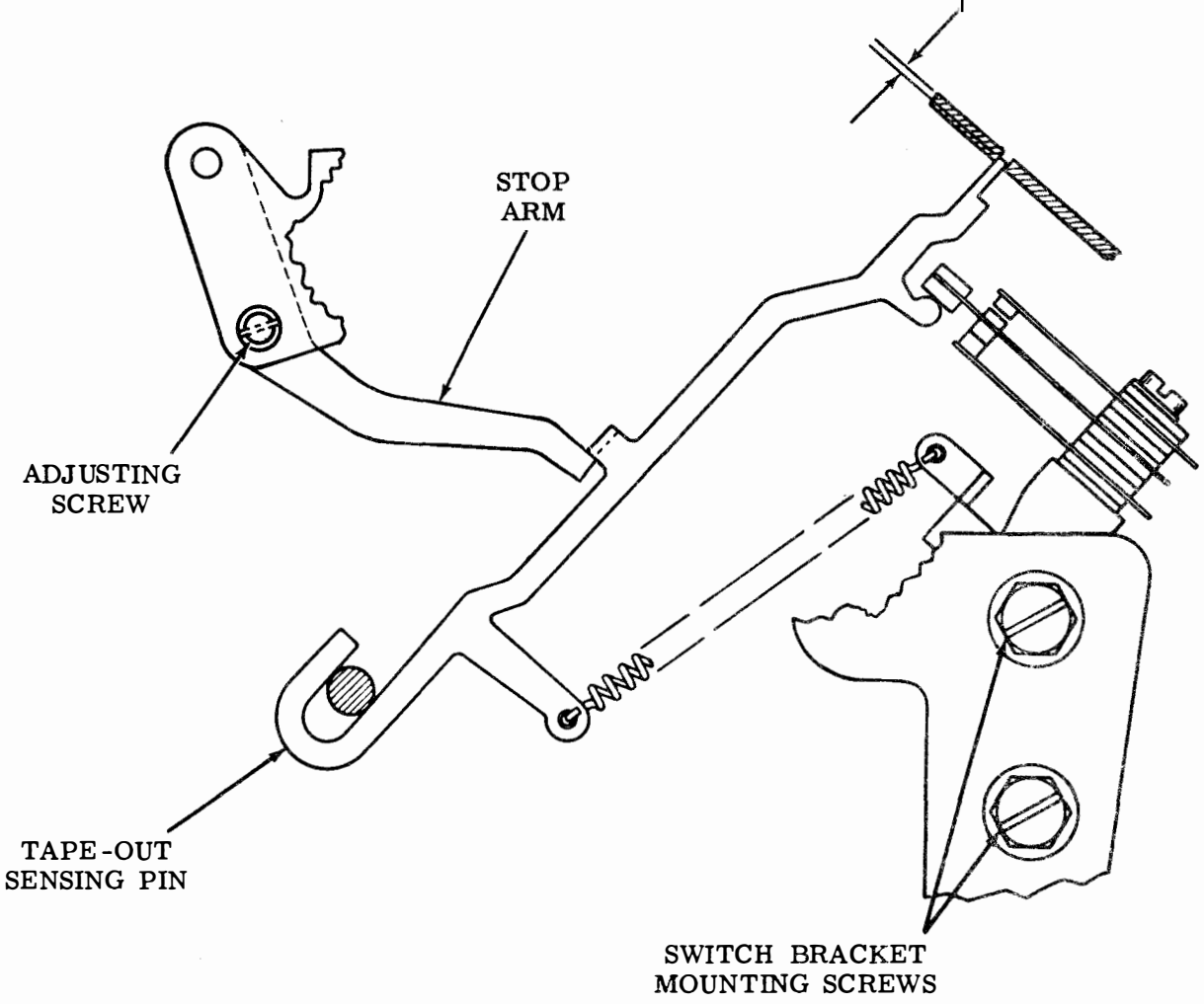
2.12 Tape-Out Switch Assembly (continued)

TAPE-OUT SENSING PIN (For Units Equipped with Tape Lid Sensing Lever)

To Check
Hold tape-out pin manually against stop arm.

Requirement
Top of pin to be
Min flush---Max 0.010 inch
below top surface of guideplate.

To Adjust
Loosen switch bracket mounting screws. Position switch bracket to meet requirement. Retighten mounting screws.



(Front View)

2.13 Start-Stop Switch Assembly

(A) START-STOP SWITCH BRACKET

To Check
Place control lever in run position.
Disengage clutch.

(1) Requirement
Min 0.006 inch---Max 0.015 inch between start-stop bail extension and insulator on start-stop switch swinger.

To Adjust
Loosen switch bracket mounting screws. Position switch bracket to meet requirement. Retighten bracket mounting screws.

(2) Requirement
Start-stop bail extension and contact arm to fully engage insulated portion of start-stop switch swinger.

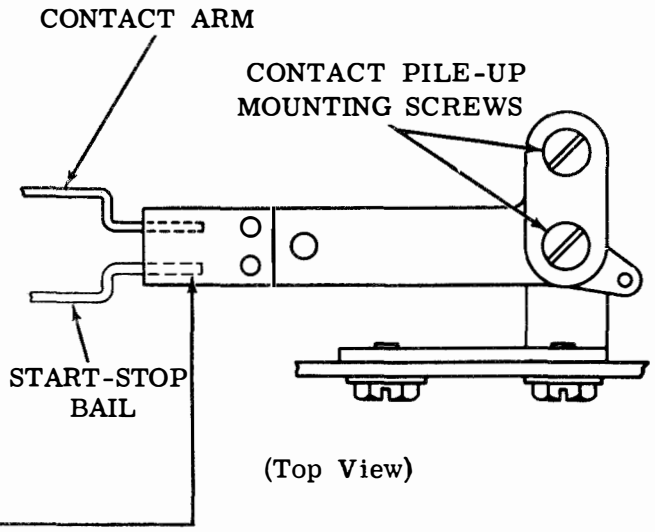
To Adjust
Loosen mounting screws and position start-stop switch swinger to meet requirement. Retighten mounting screw.

(B) TIGHT-TAPE START-STOP CONTACT SPRING

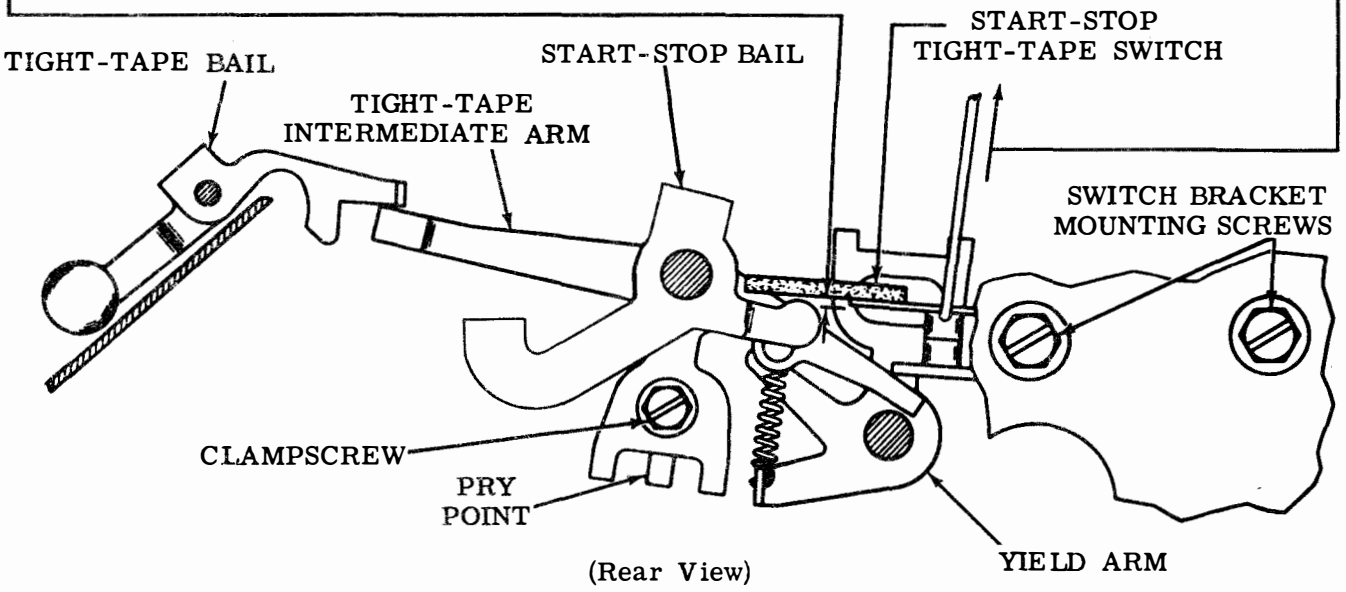
To Check
Place control lever in run position.

Requirement
Min 3 oz---Max 4 oz to separate contacts.

To Adjust
Bend break contact spring with TP110445 bending tool. Recheck START-STOP SWITCH BRACKET adjustment.



(Top View)



(Rear View)

2.14 Tight-Tape Mechanism

START-STOP SWITCH BRACKET (For Units Equipped with Tape Lid Sensing Lever)

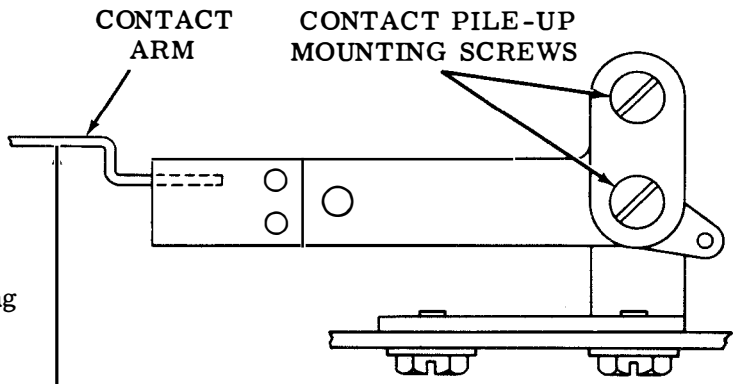
To Check
Place intermediate tight-tape arm to center of its adjusting range with the contact arm.

(1) Requirement
Tight-tape start-stop contacts to:
(a) Remain closed when tight-tape bail is raised 0.045 inch
(b) Open as bail is raised to 0.075 inch.

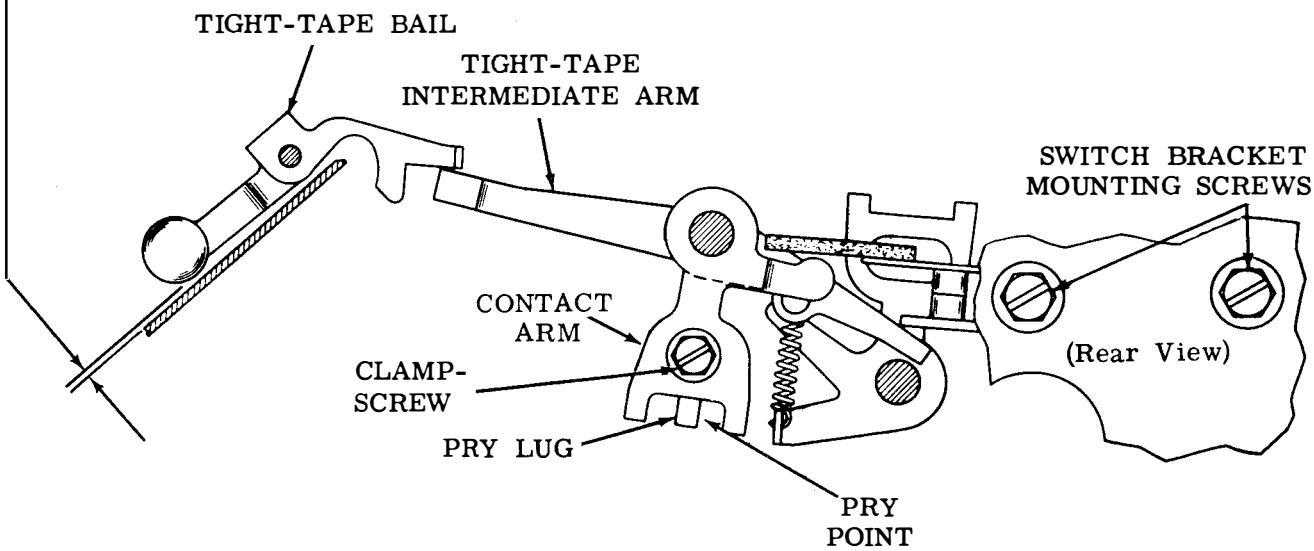
To Adjust
(a) Loosen tight-tape intermediate arm clampscrew. Position pry point midway in contact operating arm adjusting slot. Retighten clampscrew.
(b) Loosen switch bracket screws friction tight. Position contact pile-up to meet requirement.

(2) Requirement
Contact arm to fully engage insulated part of switch swinger.

To Adjust
Loosen contact pile-up mounting screws. Position contact pile-up mounting bracket. Retighten mounting screws.



(Top View)



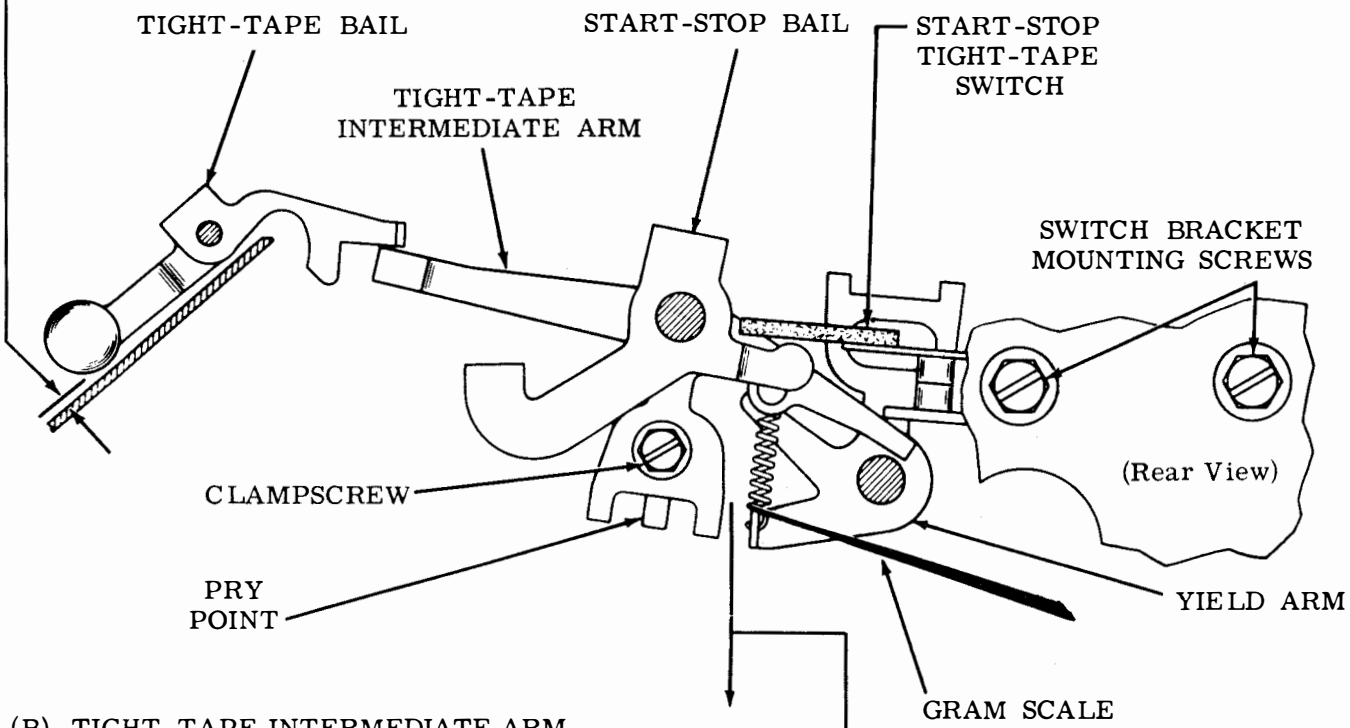
2.15 Tight-Tape Mechanism (continued)

(A) TIGHT-TAPE INTERMEDIATE ARM

To Check
Place control lever in run position.

Requirement
Start-stop contacts when tight-tape bail is raised away from tape guideplate:
(a) Remain closed when bail is raised 0.045 inch.
(b) Open as bail is raised to 0.075 inch.

To Adjust
Loosen clampscrew and position tight-tape intermediate arm using pry points. Retighten clampscrew.



(B) TIGHT-TAPE INTERMEDIATE ARM SPRING

To Check
Place control lever in run position.

Requirement
Min 20 grams (3/4 oz)---Max 40 grams (1-1/2 oz) to start yield arm moving.

2.16 Feed Wheel Mechanism

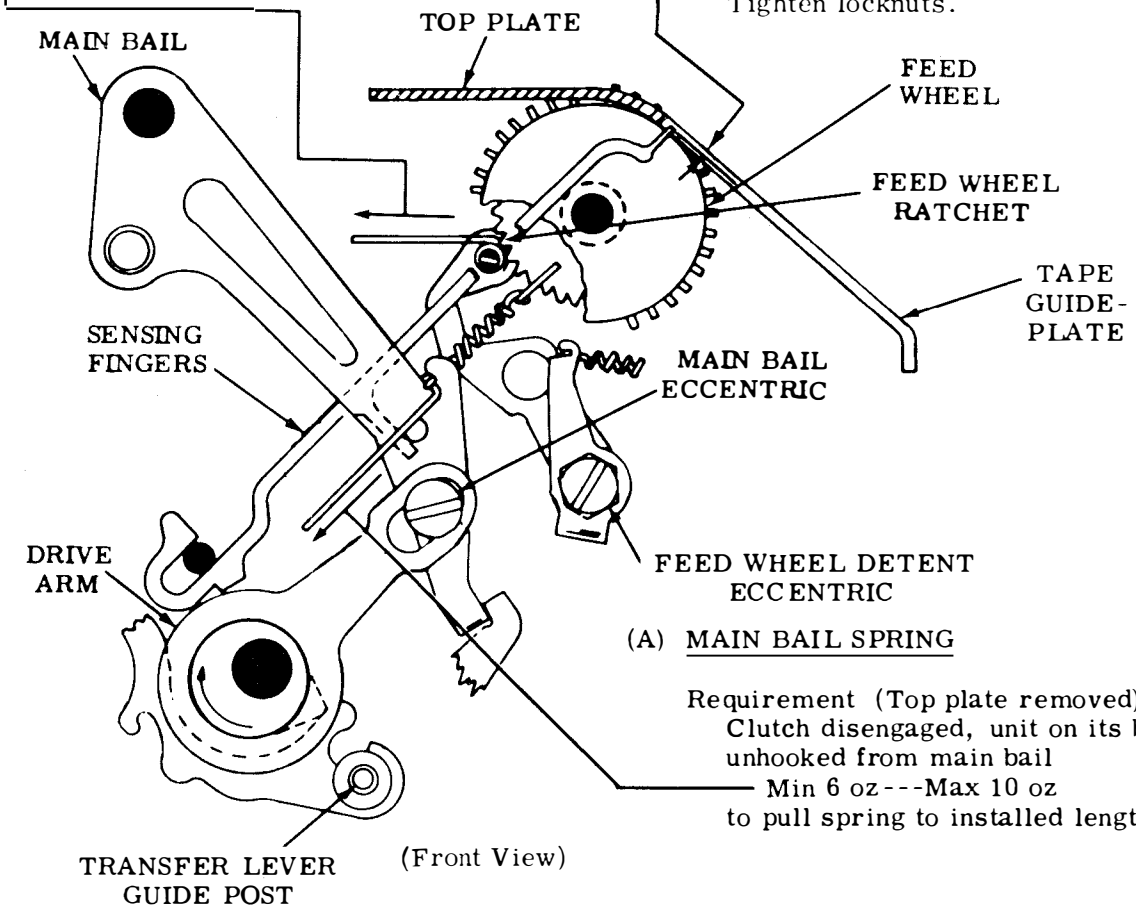
(C) MAIN BAIL TRIP LEVER

Requirement (Replace top plate)
Unit in stop position, clearance between tip of highest sensing pin and top surface of tape guideplate should be flush to 0.005 inch below.

To Adjust
With clutch disengaged, loosen front and rear transfer lever guide eccentric post locknuts. Position highest point of eccentric post (as indicated by dot on end of post) toward left and rotate post so that its eccentric positions trip lever. Tighten locknuts.

(B) FEED RATCHET DETENT SPRING

Requirement
With main shaft in stop position and feed pawl held away from its ratchet
Min 8 oz---Max 13 oz
to start roller moving away from ratchet.



(Front View)

(A) MAIN BAIL SPRING

Requirement (Top plate removed)
Clutch disengaged, unit on its back. Spring unhooked from main bail
Min 6 oz---Max 10 oz
to pull spring to installed length.

2.17 Main Bail Mechanism

MAIN BAIL

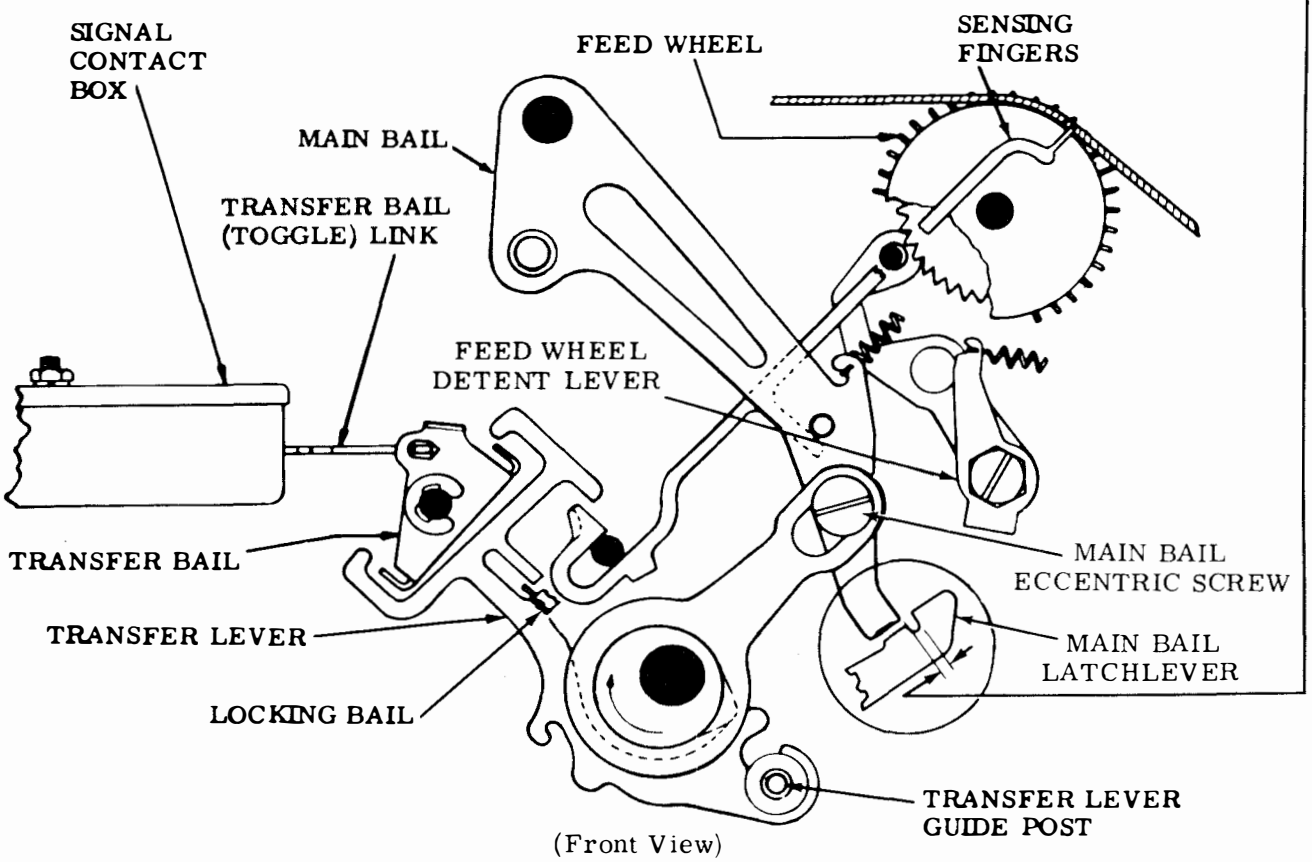
Requirement

Main bail in lowest position, horizontal clearance between main bail arm and main bail latchlever should be

Min some---Max 0.015 inch

To Adjust

Position main bail eccentric screw with nut on eccentric screw loosened (and high part of eccentric screw to the right). Tighten nut. Check and refine, if necessary, MAIN BAIL TRIP LEVER (2.16).



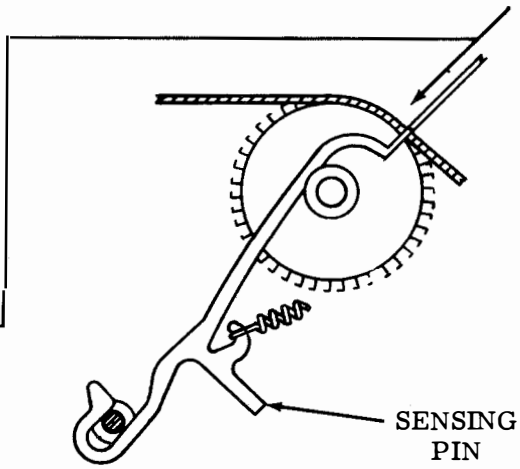
(Front View)

2.18 Feed Wheel Mechanism (continued)

(A) SENSING PIN SPRING

To Check
Open tape lid, and disengage unit clutch. Then hold armature in the attracted position to unlatch main bail and place sensing pins in their uppermost position. Hold rub-out deleter bail (if present) away from the sensing pins.

Requirement
Min 3 oz---Max 5 oz to move each sensing pin flush with tape guide plate.



(Front View)

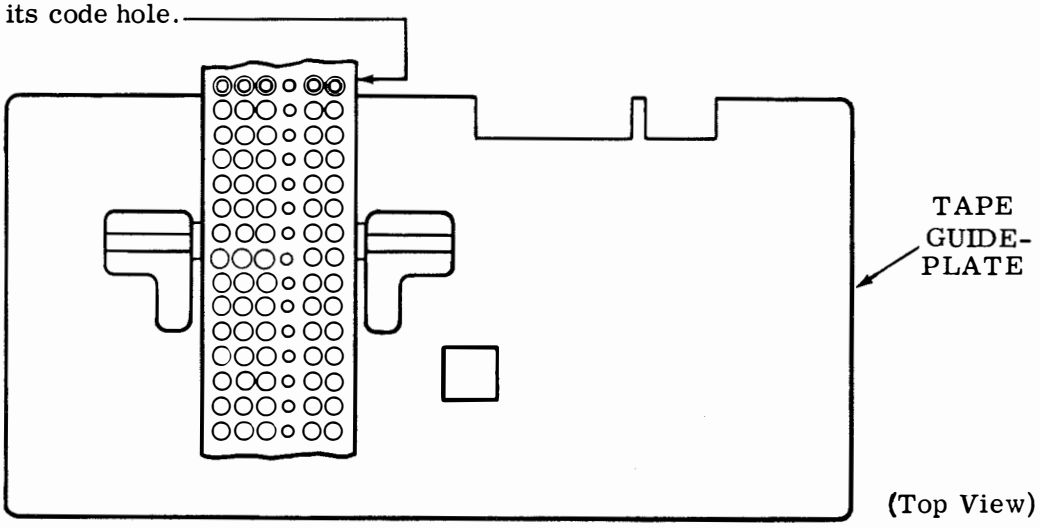
(B) FEED WHEEL DETENT

To Check
Open tape lid. Disengage the unit clutch to place sensing pins in their lowest position. Place high part of feed wheel ratchet detent eccentric toward the right. With an all marking code combination punched into a new piece of tape, place the tape on the feed wheel and over the sensing pins. Take up play in tape lightly toward the right.

Requirement
Tip of each sensing pin to be centrally located in its code hole.

To Adjust
Loosen feed wheel ratchet detent eccentric friction tight and hold feed pawl away from feed wheel ratchet. Rotate feed wheel ratchet detent eccentric, keeping high part of eccentric towards the right.

Note: When unit is used to read chadless spliced tape, the sensing pins should be made to favor the trailing edge of the code hole.



(Top View)

2.19 Feed Wheel Mechanism (continued)

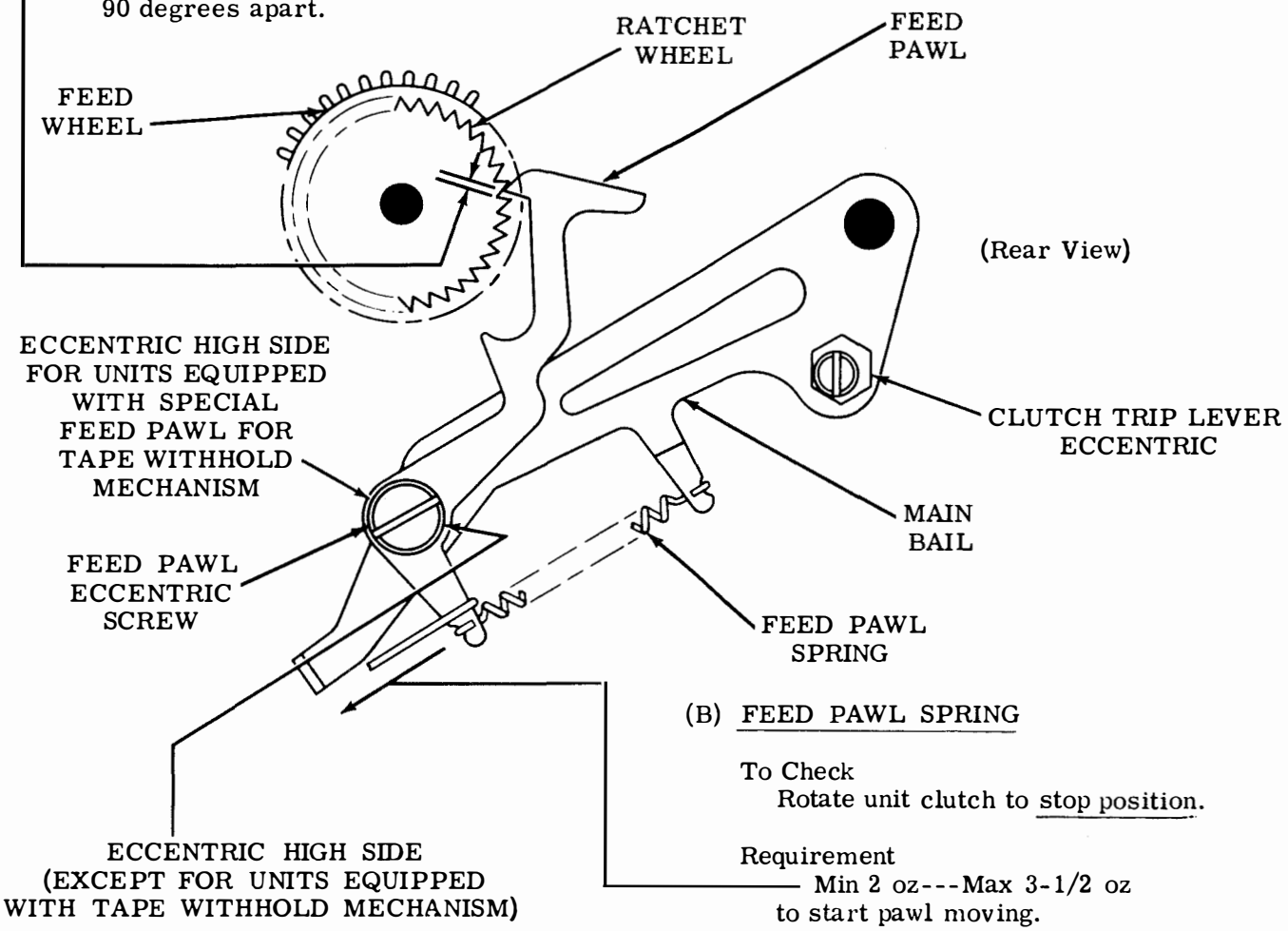
(A) FEED PAWL

To Check
Remove the top plate. With the high part of the feed pawl eccentric towards the right,* (viewed from rear plate) disengage the clutch to place the sensing pins in their lowest position.

*Left for units equipped with tape withhold mechanism.

Requirement
Min some---Max 0.003 inch between feed pawl and ratchet tooth just engaged.

To Adjust
Loosen feed pawl eccentric locknut, and position feed pawl eccentric. Recheck requirement at four positions on feed wheel ratchet approximately 90 degrees apart.

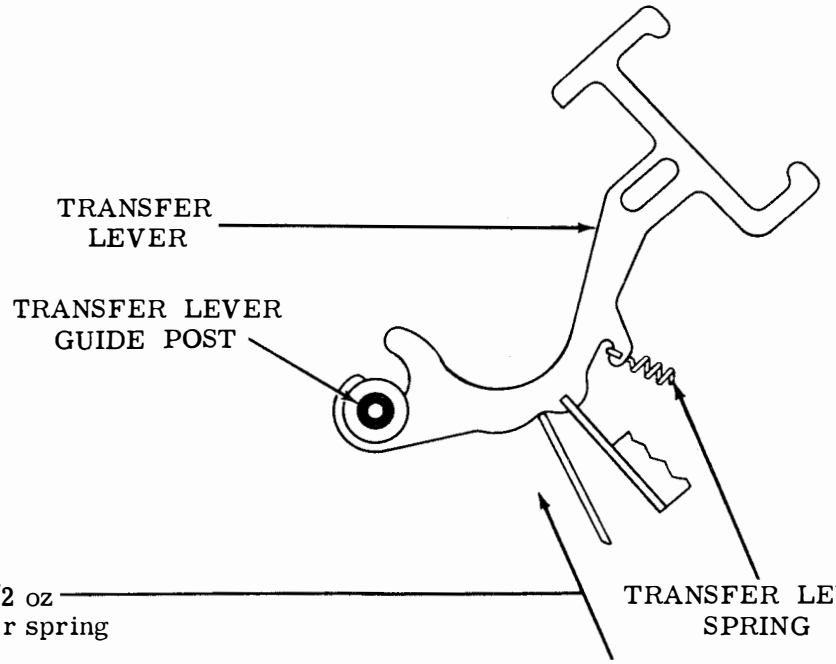


(B) FEED PAWL SPRING

To Check
Rotate unit clutch to stop position.

Requirement
Min 2 oz---Max 3-1/2 oz to start pawl moving.

2.20 Transfer Mechanism

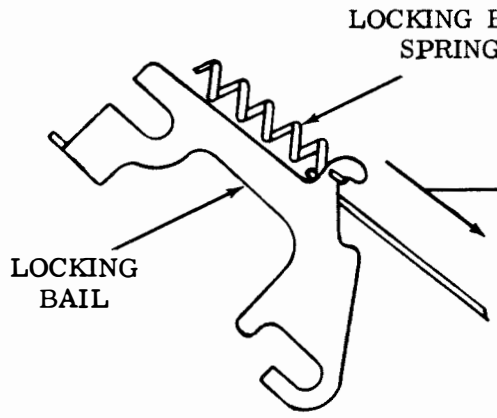


(A) TRANSFER LEVER SPRING

To Check
Disengage unit clutch.

Requirement
Min 1/2 oz---Max 1-1/2 oz to start each transfer lever spring moving.

(Rear View)



(B) LOCKING BAIL SPRING

Requirement
Min 10 oz---Max 14 oz to pull locking bail spring to its installed length.

(Front View)

2.21 Transfer Bail

(A) TRANSFER BAIL STABILIZER

(1) To Check
Select a LETTERS combination. Rotate main shaft until #3 transfer lever is on high part of its cam. Check clearance between side of transfer bail extension and marking latch.

(2) To Check
Select a BLANKS combination. Rotate main shaft until #3 transfer lever is on high part of its cam. Check clearance between side of transfer bail extension and spacing latch.

Requirement
Clearance in marking and spacing positions should be equal within 0.002 inch.

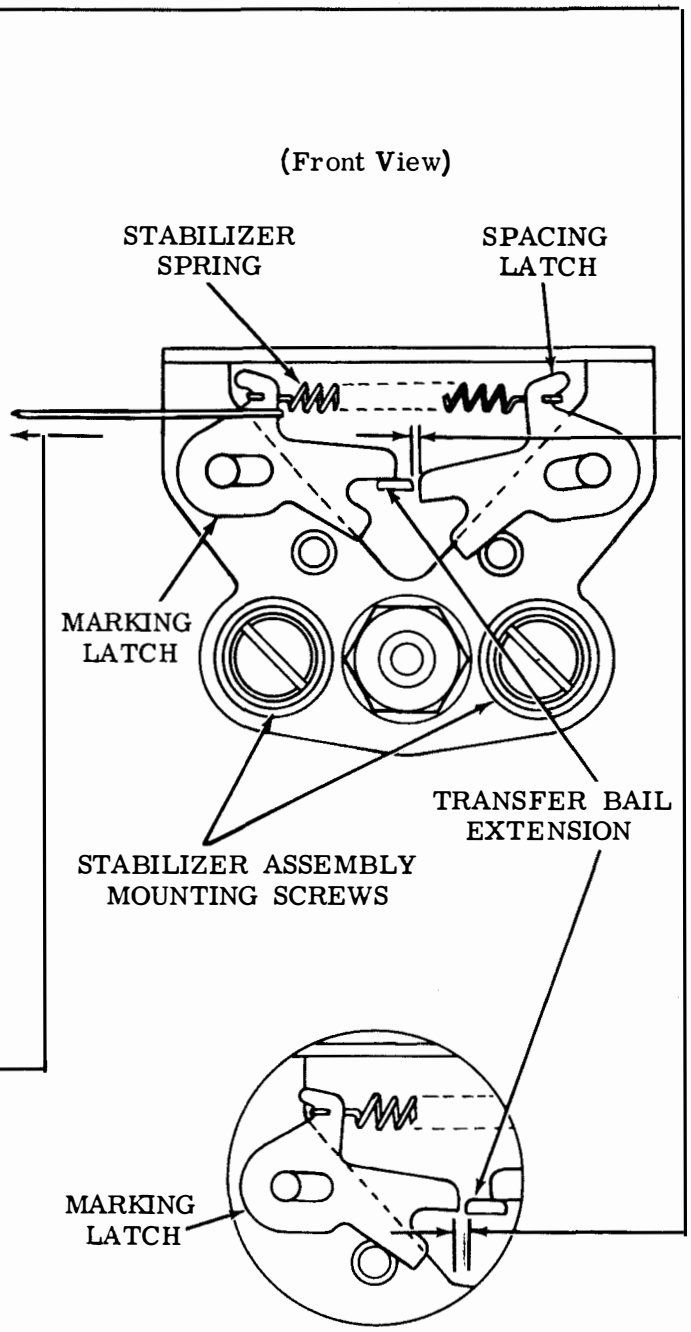
To Adjust
Loosen stabilizer assembly mounting screws friction tight, and position the assembly. Retighten assembly mounting screws.

(B) STABILIZER SPRING

To Check
Rotate clutch to stop position.

Requirement
Min 2-1/2 oz---Max 5 oz to start stabilizer latch moving.

Note: Latches should drop in place as other transfer levers cam the transfer bail.



2.22 Signal Contacts

(A) SIGNAL CONTACT CLEARANCE

To Check

Remove cover plate and signal contact box cover. Engage the unit clutch and rotate main shaft slowly until spacing contact is fully open. Measure the gap. Continue rotating the main shaft until marking contact is fully open. Measure the gap.

Requirement

Marking and spacing contact gaps measured in To Check to be equal within 0.001 inch.

To Adjust

Loosen mounting screws and position contact box using eccentric.

Note: Before operating, refine SIGNAL CONTACT CLEARANCE adjustment in accordance with Signal Contacts — Electrical.

CAUTION: IF CONTACTS ARE GOLD PLATED, CLEAN THEM BY PARTIALLY DRAWING A STRIP OF TP107162 TWILL JEAN BETWEEN THEM.

(B) DRIVE LINK SPRING

To Check

Trip clutch and rotate main shaft to stop position. Unhook stabilizer spring, and move latches away from transfer bail extension. Hold toggle firmly against spacing contact.

Requirement

Min 6 oz---Max 12 oz to start transfer bail extension moving.

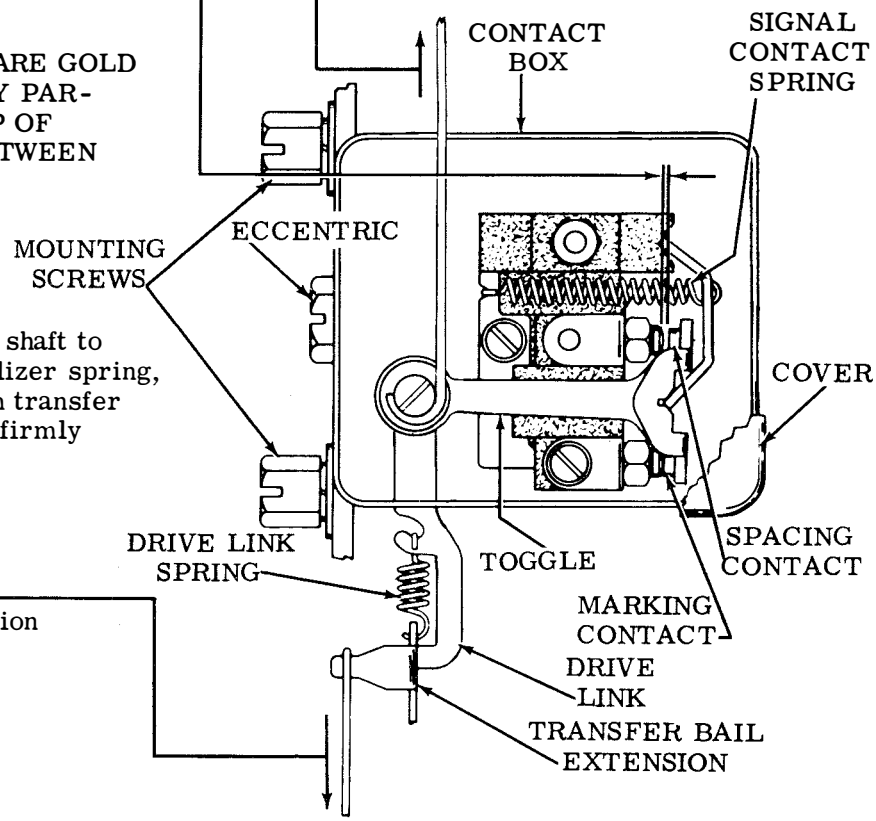
(C) SIGNAL CONTACT SPRING (TRANSMITTER DISTRIBUTOR SETS ONLY)

To Check

Place transmitter in stop position. Remove contact box cover, and toggle drive link spring from its link end. Move transfer bail towards the right (spacing) position, so that both toggle contacts are closed. Hook an 8-oz scale over the pivot screw and pull horizontally to the left.

Requirement

Min 2 oz---Max 3-1/2 oz to open left-hand contact. Replace toggle drive link spring to its link.



(Top View - Right Side)

2.23 Clutch Mechanism (continued)

CLUTCH MAGNET ASSEMBLY (Preliminary)

(1) Requirement

In energized position armature should contact top core face and should have
—Min some---Max 0.004 inch
clearance at bottom core face at point of least clearance when play is taken up to make clearance a maximum. (Sets with tape shoe and tape feed assurance mechanisms
—Min 0.004 inch---Max 0.007 inch)

To Adjust

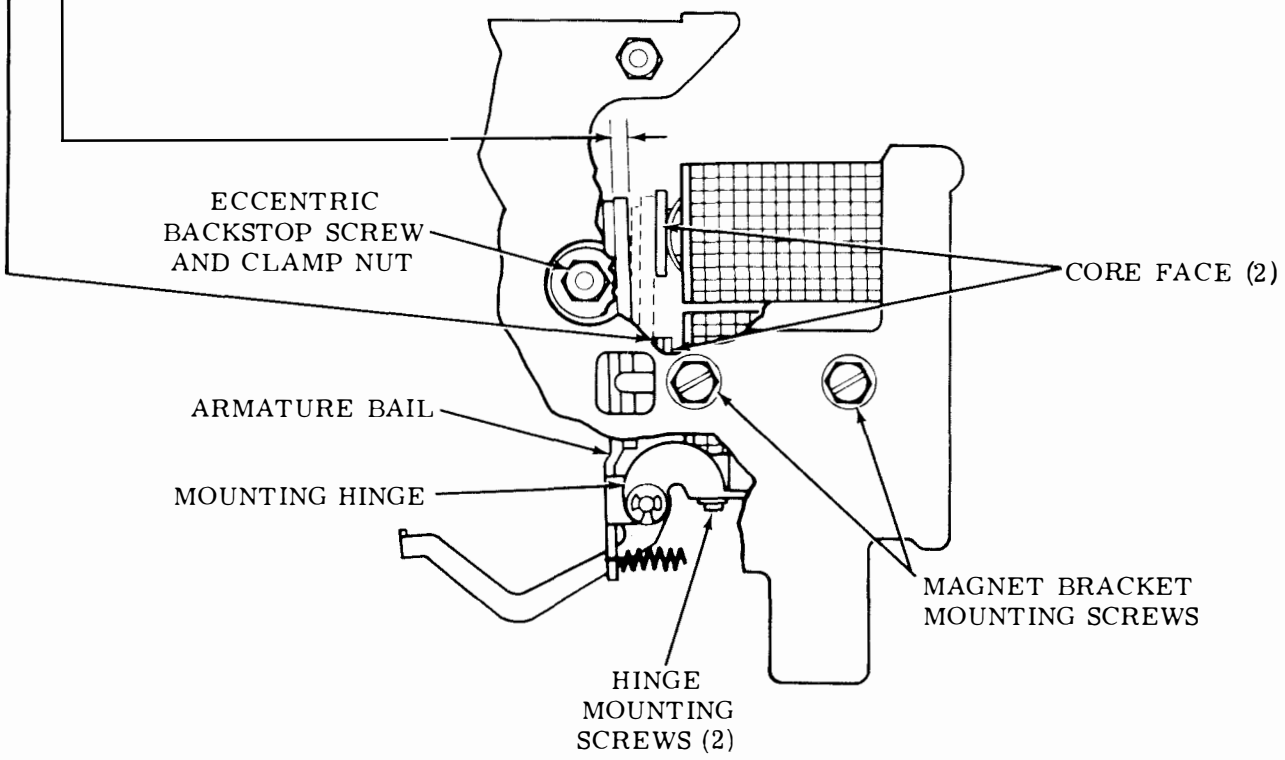
Remove magnet bracket mounting screws and magnet assembly from unit. Loosen two screws on bottom of magnet assembly and position mounting hinge until required condition is obtained. Tighten screws.

(2) Requirement

With high part of eccentric toward top of assembly, clearance between armature bail and eccentric backstop when armature is held in energized position should be
—Min 0.045 inch---Max 0.055 inch

To Adjust

Loosen eccentric backstop screw clamp nut. With high part of eccentric toward top of assembly, position screw. Tighten clamp nut.



(Rear View)

2.24 Clutch Mechanism (continued)

CLUTCH MAGNET ASSEMBLY (Preliminary) (Continued)

(3) Requirement

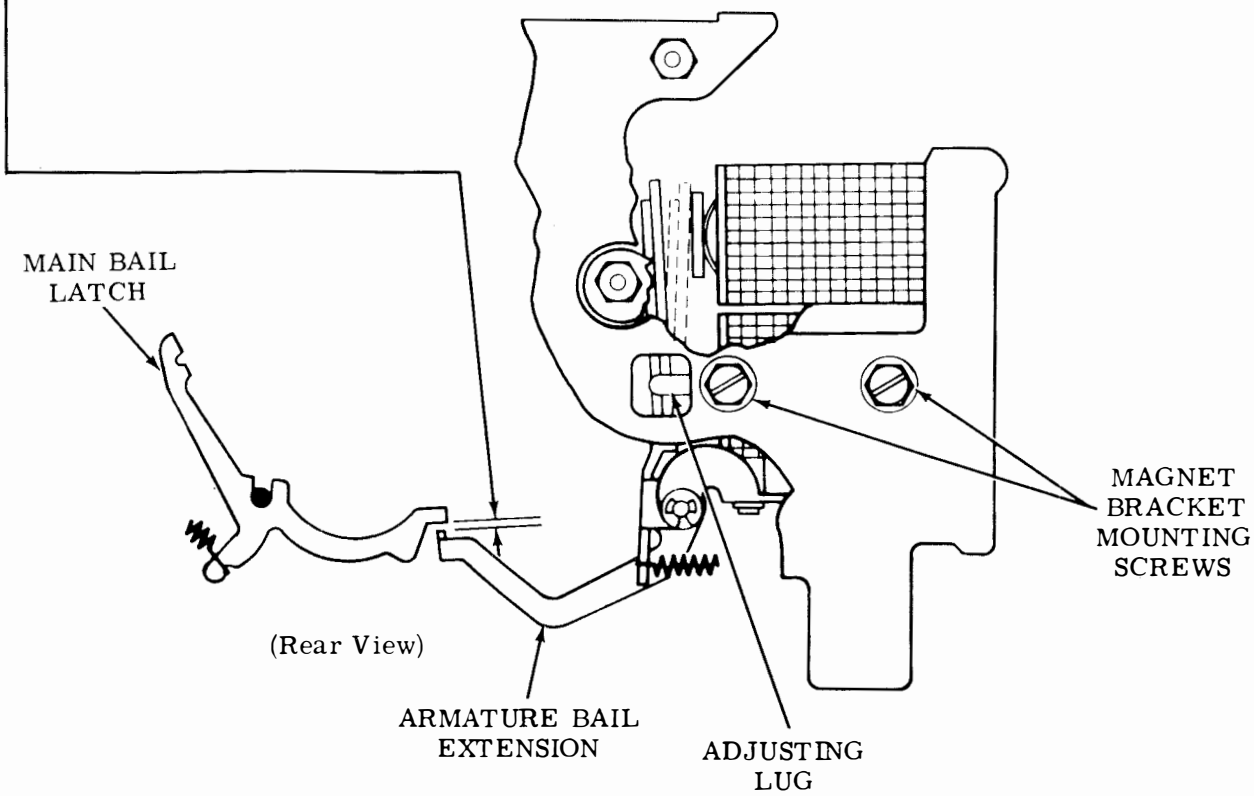
With magnet assembly replaced and clutch disengaged, clearance between end of armature bail extension and main bail latch

Min 0.007 inch---Max 0.015 inch

To Adjust

With magnet bracket mounting screws friction tight, move bracket to its lowermost position, then position bracket by means of adjusting lug on bracket (visible through hole in rear plate). Tighten screws. Refine requirements if necessary.

Note: The above adjustments may be considered final unless ac power is used, a check should be made to insure that the chatter is at a minimum. If excessive chatter is present, Requirement (1) will have to be refined and Requirements (2) and (3) rechecked.

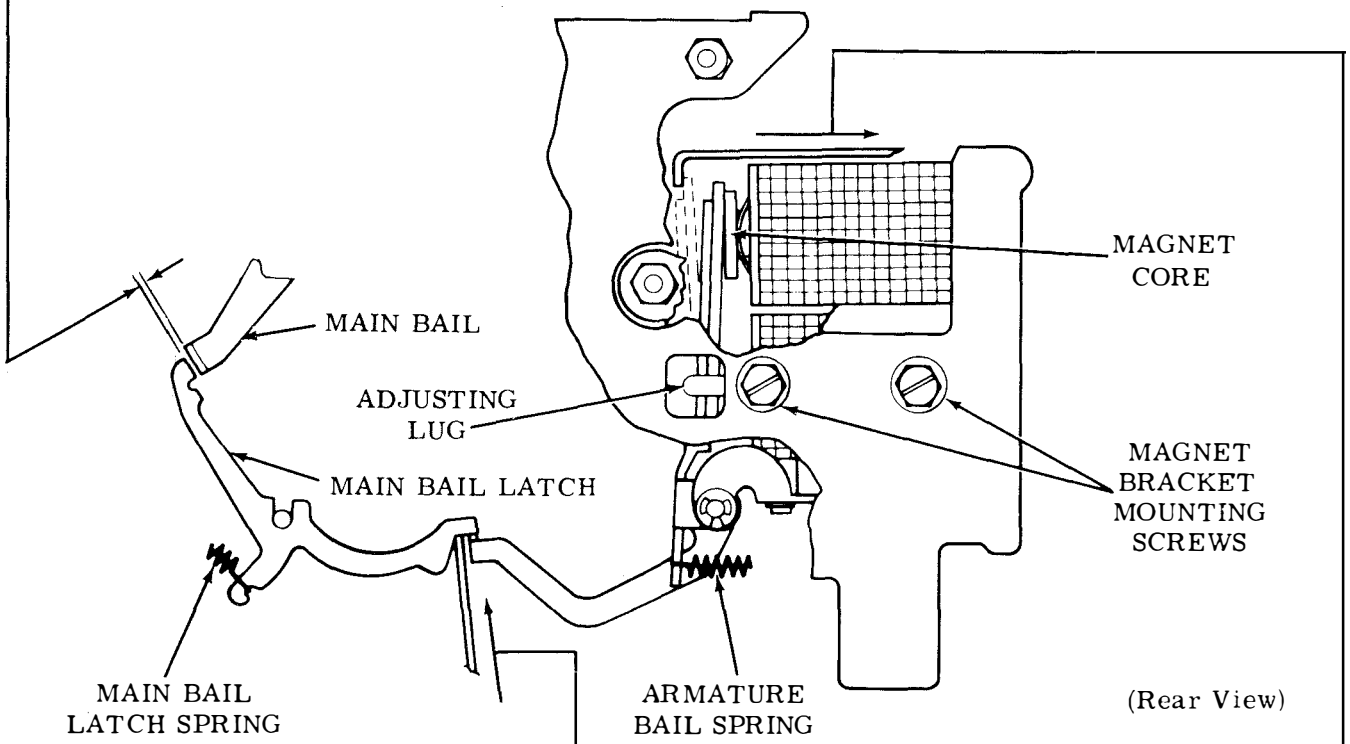


2.25 Clutch Mechanism (continued)

CLUTCH MAGNET ASSEMBLY (Preliminary) (Continued)

(4) Requirement
With armature electrically held against its magnet core, clearance between vertical surfaces of the main bail and its latchlever
Min some

To Adjust
With magnet bracket mounting screws friction tight, move bracket to its lowermost position, then position bracket by means of adjusting lug on bracket (visible through hole in rear plate). Tighten screws. Refine requirement if necessary.



MAIN BAIL LATCH SPRING

Requirement
With unit inverted and main bail latch released
Min 3/4 oz---Max 2 oz
to start main bail latch moving.

ARMATURE BAIL SPRING

Requirement
With armature in de-energized position and main bail latchlever held away from the armature bail extension
Min 1 oz---Max 2 oz
(Sets with tape shoe and tape feed assurance mechanisms only
Min 3-3/4 oz---Max 4-3/4 oz)
to start bail moving.

Signal Contacts — Electrical

2.26 The strobing adjustment procedure is used for checking and adjusting signal contacts electrically, and at the same time, refining the mechanical adjustments for the transmitter distributor. The same procedure is used for checking both the marking and spacing pulses for both 5 and 6 level, and all unit codes. Differences exist, however, in the number, width, and tolerance of pulses, and in the allowable break width. The data appropriate to each level and unit code is tabulated on the associated Pulse Data Table. By following the general procedures given in Paragraphs 2.27 and 2.28 following, and using data from the appropriate table, the marking and spacing pulse adjustment can be made for all units. To illustrate the procedure further, the data appropriate to a 5-level, 7.42 unit code is added parenthetically as an example in the general adjustment procedure following.

Note: Gold-plated signal contacts should not be electrically adjusted unless there is an intermediate device available which, when keyed by the signal contacts, will interrupt the current to the stroboscopic test set. The intermediate device must be capable of being keyed by a 3- to 20-volt change in voltage at a current not in excess of 20 milliamperes. The standard stroboscopic test set operating voltage must not be applied directly to the signal contacts because of the possibility of damaging the contacts' gold plating and thus impairing their operating efficiency in this low-energy level application. (Refer to Paragraphs 1.08 through 1.13.)

2.27 Marking Pulse Adjustments

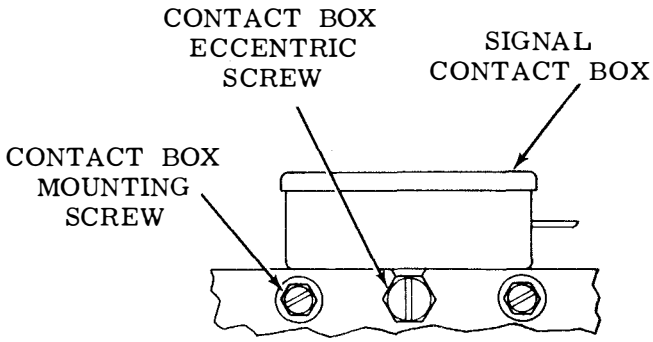
(a) Plug a signal distortion test set having the appropriate scale (eg, 7.42) into the signal line so that the marking contacts of the transmitter-distributor unit under test will interrupt the current to the stroboscopic lamp within the DXD. Have the transmitter-distributor transmitting "Y" or "R" continuously and the test set and transmitter-distributor operating at the same speed (100 wpm). Rotate the test scale to align the 0-scale mark of the START segment (end of STOP segment) with the end of the stop pulse image indicated by the rotating strobe light.

Note: The end of the stop pulse image should not vary more than one division in either direction when the scale is positioned so that the variation is centered about the 0-scale mark of the START segment.

(b) Check the position of each of the pulses against the position tabulated. Each pulse should be in its designated segment on the test scale, within the specified tolerance figure (eg, 15 div).

Note: Each marking code pulse may have one break, provided the break is not longer than the allowable break width specified (eg, 1 div) and the break comes within the tolerance range (eg, 5 div) and the end of the pulse.

(c) To adjust, loosen the two contact box mounting screws until they are friction tight. Rotate the eccentric of the contact box mounting bracket toward the right or left until the requirements are met. Tighten the mounting screws and recheck the adjustment.



(Front View)

Note: If these signal requirements cannot be met, refine the TRANSMITTER DISTRIBUTOR GEAR BACKLASH (2.32) adjustment (See BASES) and the TRANSFER BAIL STABILIZER (2.21) adjustment, viewing the signal on the test set.

2.28 Spacing Pulse Adjustments: The general procedure for adjusting the spacing pulse is identical to that outlined for marking pulses. The tolerances for spacing pulses may not be the same as for marking pulses however. Refer to the appropriate Pulse Data Table when making adjustments.

Note: On units equipped with signal regenerators, remove regenerator circuit card before applying test set probes to contact access terminals.

CAUTION: APPLYING OPERATING VOLTAGE OF DISTORTION TEST SET DIRECTLY TO GOLD-PLATED CONTACTS MAY MAKE THEM UNSUITABLE FOR LOW-VOLTAGE APPLICATIONS. REFER TO 1.12 FOR SERVICING INSTRUCTIONS.

2.29 Follow the general procedure outlined in Paragraphs 2.27 and 2.28 substituting the appropriate data from the following table.

PULSE DATA TABLE
FIVE-LEVEL UNITS, 7.00 UNIT CODE

PULSE	MARKING		SPACING	
RANGE	*NOMINAL	TOLERANCE	*NOMINAL	TOLERANCE
STOP PULSE	36 (STOP) TO 142 (STOP)	BEGIN ±5 DIV END ±1/2 DIV	36 (STOP) TO 142 (START)	BEGIN ±6 DIV END ±1/2 DIV
START PULSE	142 (STOP) TO 6 (ONE)	BEGIN ±5 DIV END ±5 DIV	142 (STOP) TO 6 (ONE)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 1	6 (ONE) TO 12 (TWO)	BEGIN ±5 DIV END ±5 DIV	6 (ONE) TO 12 (TWO)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 2	12 (TWO) TO 18 (THREE)	BEGIN ±5 DIV END ±5 DIV	12 (TWO) TO 18 (THREE)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 3	18 (THREE) TO 24 (FOUR)	BEGIN ±5 DIV END ±5 DIV	18 (THREE) TO 24 (FOUR)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 4	24 (FOUR) TO 30 (FIVE)	BEGIN ±5 DIV END ±5 DIV	24 (FOUR) TO 30 (FIVE)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 5	30 (FIVE) TO 36 (STOP)	BEGIN ±5 DIV END ±5 DIV	30 (FIVE) TO 36 (STOP)	BEGIN ±6 DIV END -5, +6 DIV
ALLOWABLE BREAK WIDTH	1 DIV	MUST FALL WITHIN PULSE TOLERANCE	1 DIV	MUST FALL WITHIN PULSE TOLERANCE

*Ranges specified apply only for test sets (DXD) having a 7.42 unit code scale.

2.30 Follow the general provisions outlined in Paragraphs 2.27 and 2.28 substituting the appropriate data from the following table.

PULSE DATA TABLE
FIVE-LEVEL UNITS, 7.42 UNIT CODE

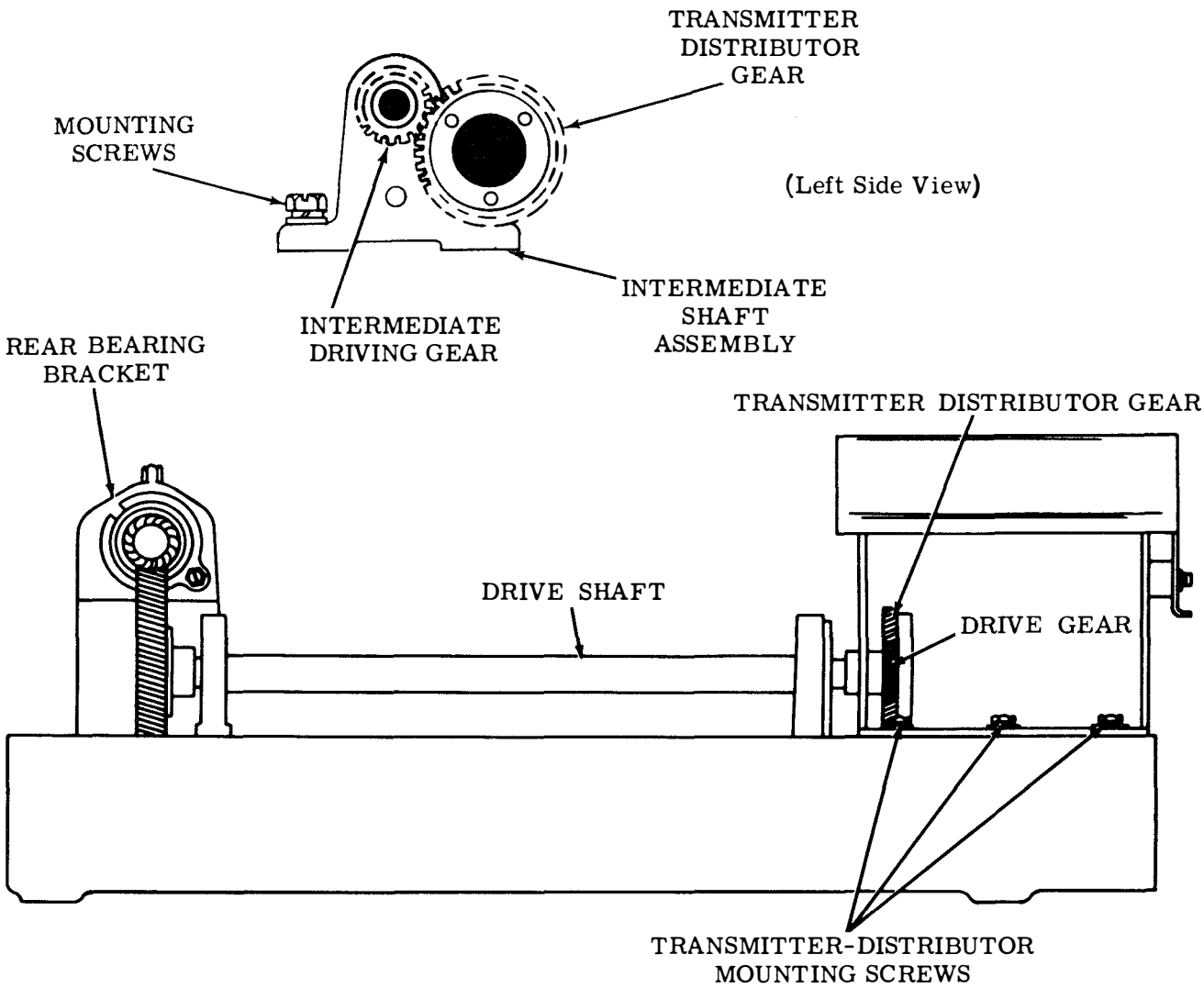
PULSE	MARKING		SPACING	
RANGE	NOMINAL	TOLERANCE	NOMINAL	TOLERANCE
STOP PULSE	0 (STOP) TO 0 (START)	BEGIN ±5 DIV END ±1/2 DIV	0 (STOP) TO 0 (START)	BEGIN ±6 DIV END ±1/2 DIV
START PULSE	0 (START) TO 0 (ONE)	BEGIN ±5 DIV END ±5 DIV	0 (START) TO 0 (ONE)	BEGIN ±6 DIV END ±6 DIV
PULSE 1	0 (ONE) TO 0 (TWO)	BEGIN ±5 DIV END ±5 DIV	0 (ONE) TO 0 (TWO)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 2	0 (TWO) TO 0 (THREE)	BEGIN ±5 DIV END ±5 DIV	0 (TWO) TO 0 (THREE)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 3	0 (THREE) TO 0 (FOUR)	BEGIN ±5 DIV END ±5 DIV	0 (THREE) TO 0 (FOUR)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 4	0 (FOUR) TO 0 (FIVE)	BEGIN ±5 DIV END ±5 DIV	0 (FOUR) TO 0 (FIVE)	BEGIN ±6 DIV END -5, +6 DIV
PULSE 5	0 (FIVE) TO 0 (STOP)	BEGIN ±5 DIV END ±5 DIV	0 (FIVE) TO 0 (STOP)	BEGIN ±6 DIV END -5, +6 DIV
ALLOWABLE BREAK WIDTH	±1 DIV	MUST FALL WITHIN TOLERANCE LIMITS	±1 DIV	MUST FALL WITHIN TOLERANCE LIMITS

2.31 Follow the general provisions outlined in Paragraphs 2.27 and 2.28 substituting the appropriate data from the following table.

PULSE DATA TABLE
SIX-LEVEL UNITS, 8.50 UNIT CODE

PULSE	MARKING		SPACING	
RANGE	NOMINAL	TOLERANCE	NOMINAL	TOLERANCE
STOP PULSE	0 (STOP) TO 0 (START)	BEGIN ±7 DIV END ±1/2 DIV	0 (STOP) TO 0 (START)	BEGIN ±8 DIV END ±1/2 DIV
START PULSE	0 (START) TO 0 (ONE)	BEGIN ±7 DIV END ±7 DIV	0 (START) TO 0 (ONE)	BEGIN ±8 DIV END ±8 DIV
PULSE 1	0 (ONE) TO 0 (TWO)	BEGIN ±7 DIV END ±7 DIV	0 (ONE) TO 0 (TWO)	BEGIN ±8 DIV END ±8 DIV
PULSE 2	0 (TWO) TO 0 (THREE)	BEGIN ±7 DIV END ±7 DIV	0 (TWO) TO 0 (THREE)	BEGIN ±8 DIV END ±8 DIV
PULSE 3	0 (THREE) TO 0 (FOUR)	BEGIN ±7 DIV END ±7 DIV	0 (THREE) TO 0 (FOUR)	BEGIN ±8 DIV END ±8 DIV
PULSE 4	0 (FOUR) TO 0 (FIVE)	BEGIN ±7 DIV END ±7 DIV	0 (FOUR) TO 0 (FIVE)	BEGIN ±8 DIV END ±8 DIV
PULSE 5	0 (FIVE) TO 0 (SIX)	BEGIN ±7 DIV END ±7 DIV	0 (FIVE) TO 0 (SIX)	BEGIN ±8 DIV END ±8 DIV
PULSE 6	0 (SIX) TO 0 (STOP)	BEGIN ±7 DIV END ±7 DIV	0 (SIX) TO 0 (STOP)	BEGIN ±8 DIV END ±8 DIV
ALLOWABLE BREAK WIDTH	1 DIV	MUST LIE WITHIN TOLERANCE LIMITS	1 DIV	MUST LIE WITHIN TOLERANCE LIMITS

2.32 Basic Gear Adjustments



(Left Side View)

INTERMEDIATE GEAR — TRANSMITTER DISTRIBUTOR GEAR BACKLASH

To Check

With the MOTOR POSITION and TRANSMITTER DISTRIBUTOR POSITION adjustments completed, check the backlash between the gears.

(1) Requirement

Only a perceptible amount of backlash between the intermediate driving gear and the transmitter distributor gear.

To Adjust

Loosen three mounting screws that secure the transmitter distributor unit to its base. Position transmitter distributor to meet the requirement. Retighten the mounting screws.

(2) Requirement

Only a perceptible amount of backlash between the drive gear and the transmitter distributor gear.

To Adjust

Loosen three mounting screws that secure the transmitter distributor to its base. Position transmitter distributor to meet this requirement. Retighten the screws.

3. VARIABLE FEATURES

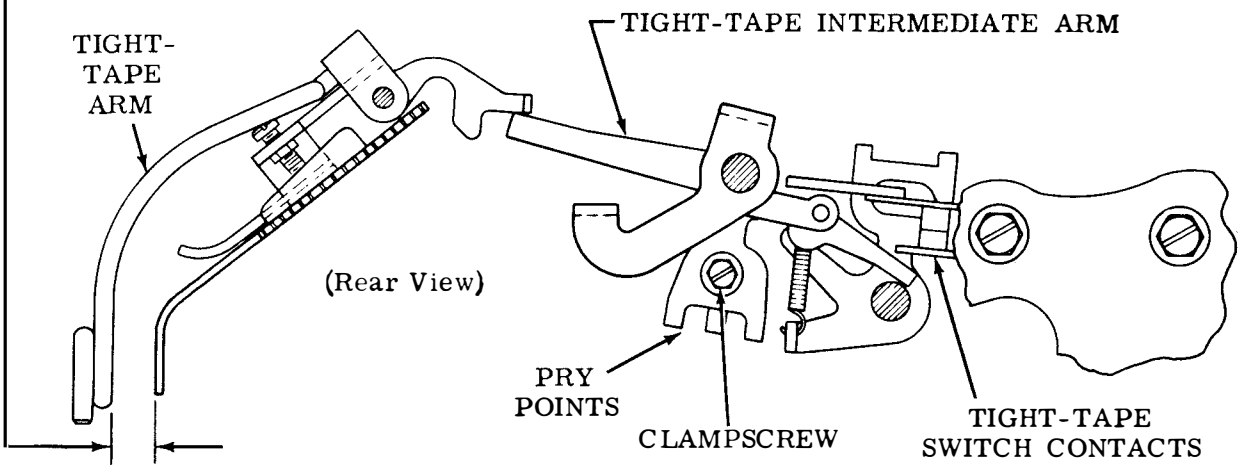
3.01 Tight-Tape and Tape Shoe Mechanism

(A) TIGHT-TAPE SWITCH

To Check
Place control lever in run position.

Requirement
Min 9/32 inch---Max 13/32 inch to open contacts when tight-tape arm is raised.

To Adjust
Loosen clampscrew. Using adjusting slot, position tight-tape intermediate arm to meet this requirement. Retighten clampscrew.



(B) TORSION SPRING

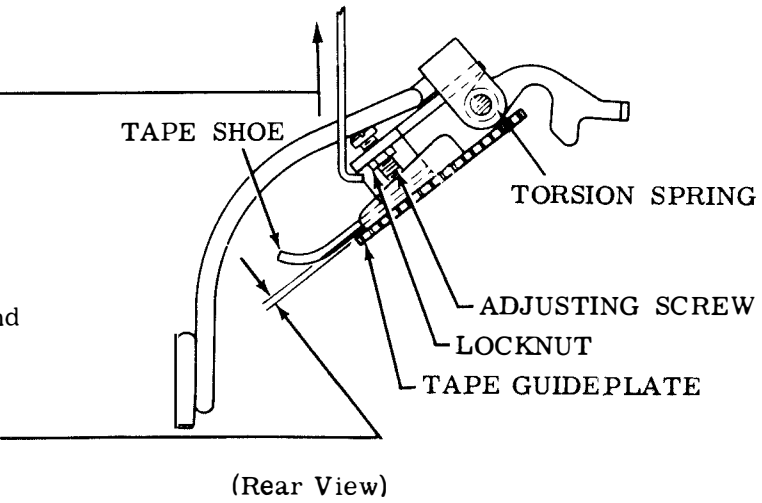
Requirement
Min 2-1/2 oz to lift tape shoe.

(C) TAPE SHOE

To Check
Latch tape lid in position. Check clearance between tape guideplate and tape shoe.

Requirement
Min 0.005 inch---Max 0.008 inch

To Adjust
Loosen locknut. Rotate adjusting screw to meet the requirement. Retighten locknut.



3.02 Tape Feed Assurance Mechanism

(A) TAPE SENSING FEED WHEEL PHASING

To Check
Place fresh, fully perforated tape (10 holes per inch) on tape guideplate across the feed wheel and tape feed assurance wheel. Set detent adjusting lever screw at midrange.

Requirement
Tape must lie flat on tape guideplate between feed wheel and tape feed assurance wheel.

To Adjust
Loosen bracket mounting screws friction tight. Position bracket to meet requirement. Retighten bracket mounting screws. Refine adjustment (if necessary) by rotating the detent lever adjusting screw.

Note: If tape is not available, use TP165800 gauge.

(B) TAPE MOTION CONTACT GAP

To Check
Place detent lever in detented position.

Requirement
Min 0.005 inch---Max 0.010 inch gap between the normally closed contacts.

To Adjust
Bend contact leaf and stiffener to meet requirement.

(C) TAPE MOTION CONTACT SWINGER

To Check
Hold detent lever from contact swinger.

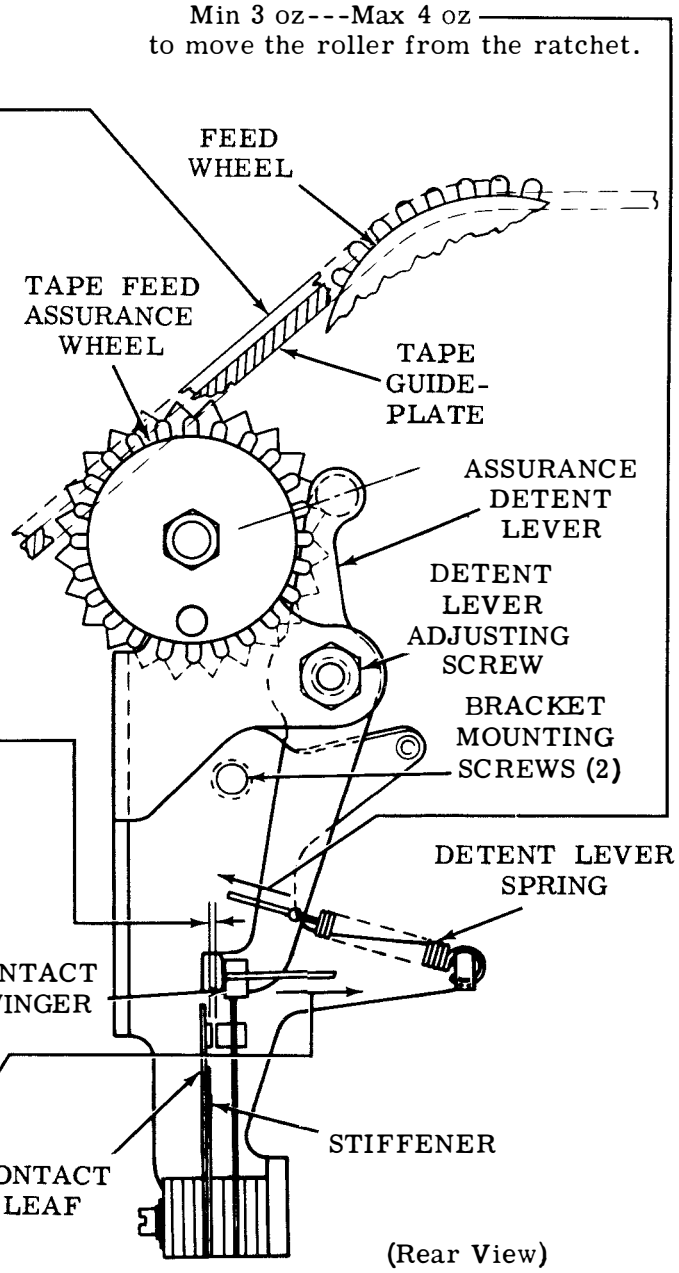
Requirement
Min 15 grams---Max 25 grams to separate contacts.

To Adjust
Bend swinger to meet requirement. Recheck TAPE MOTION CONTACT GAP.

(D) DETENT LEVER SPRING

To Check
Hold contact lever away from detent lever.

Requirement
Min 3 oz---Max 4 oz to move the roller from the ratchet.



3.03 Tape-Out Mechanism

(A) TAPE-OUT CONTACT

(1) To Check
Loosen contact bracket mounting screws. Pivot contact assembly until pad on tape-out pin extension is not touching the swinger pad. Check gap between normally open (top) contact points.

Requirement
Min 0.015 inch---Max 0.025 inch between normally open (top) contacts.

To Adjust
Bend upper contact spring to meet requirement.

(2) To Check
With assembly still in position, check force required to just separate normally closed (lower) contacts.

Requirement
Min 8 grams---Max 15 grams to just separate normally closed (lower) contacts.

To Adjust
Bend contact swinger. Recheck requirement under (1) To Check above.

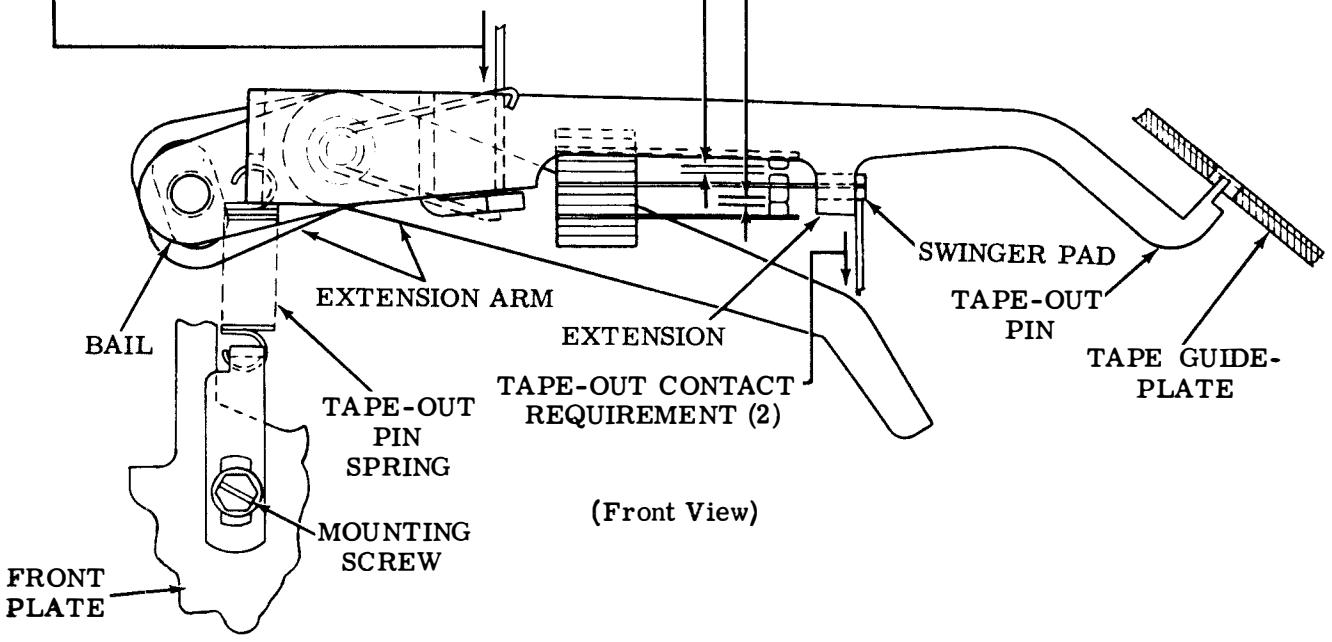
(3) To Check
Hold tape-out pin down. With some clearance between tape-out pin extension and underside of contact swinger, without tape, tape lid closed, and unit in run position, check gap between normally closed contacts.

Requirement
Min 0.008 inch---Max 0.018 inch gap between normally closed contacts.

To Adjust
With contact bracket mounting screws loosened, adjust contact mounting bracket to meet requirement. Retighten contact bracket mounting screws.

(B) TAPE-OUT BAIL TORSION SPRING

Requirement
Min 8 oz---Max 12 oz to separate bail from tape-out pin.



(Front View)

3.04 Tape-Out Mechanism (continued)

(C) TAPE-OUT PIN SPRING

To Check
Remove tape and open tape lid.

Requirement
Min 1/2 oz---Max 1 oz to press pin flush with tape guideplate.

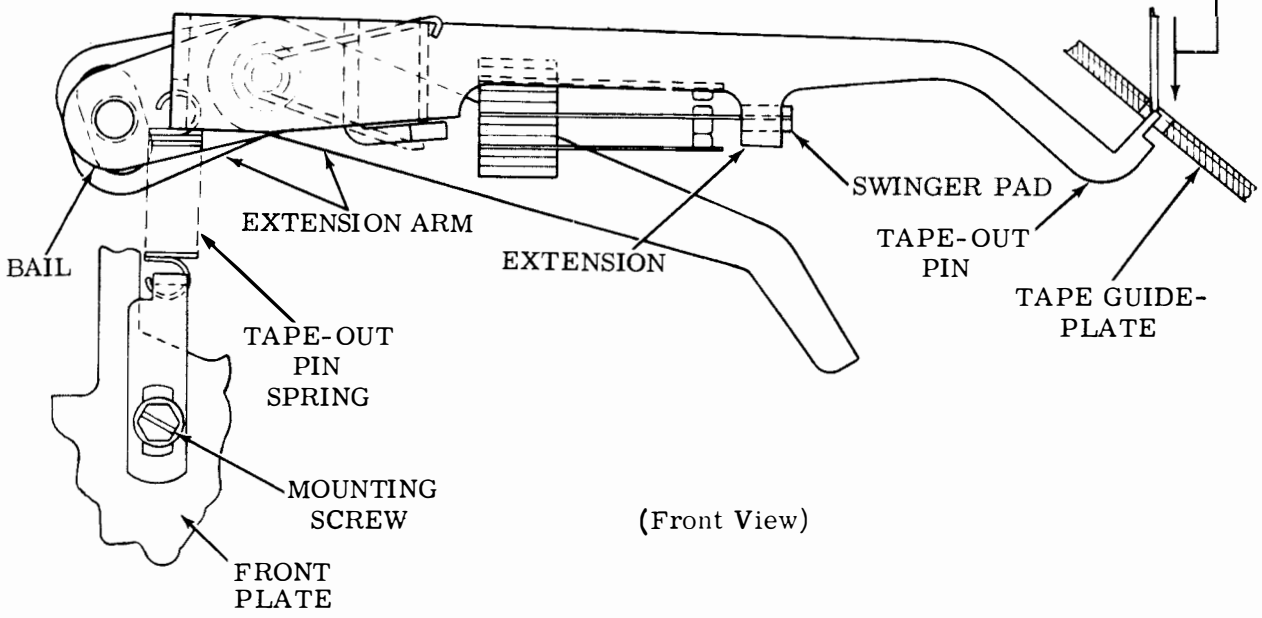
To Adjust
Loosen tape-out spring bracket mounting screw and position bracket to meet requirement. Retighten bracket mounting screw.

(D) TAPE-OUT PIN

To Check
Place control lever in free or stop position. Check position of tape-out pin in relation to tape guideplate.

Requirement
Tape-out pin should be
Min flush---Max 0.010 inch below surface of tape guideplate.

To Adjust
With control lever in stop position, loosen screw which secures the stop arm to the bracket with posts. Adjust stop arm to meet requirement. Tighten screw.



(Front View)

3.05 Code Reading Contacts

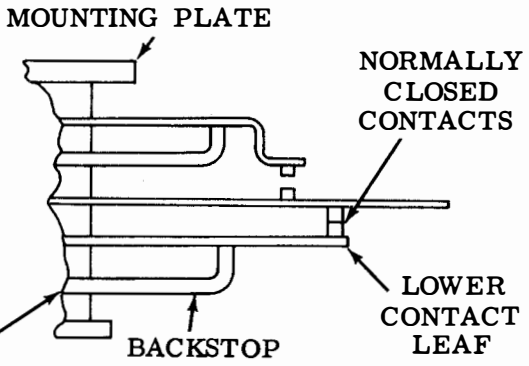
Note 1: Remove code reading contact assembly from transmitter distributor unit before making initial adjustments.

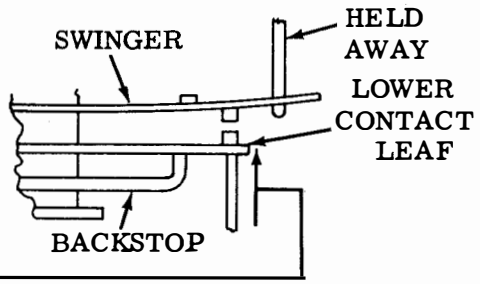
Note 2: When using the contact spring bender, start with the contact pile-up farthest from the handle of the tool and work toward the handle so as not to disturb adjustments already made.

(A) NORMALLY CLOSED CONTACTS — BACKSTOP

Requirement
Lower contact leaves for all levels should be parallel with the mounting plate and in line with one another.

To Adjust
Bend backstop to meet the requirement.





(B) NORMALLY CLOSED CONTACTS — SPRING

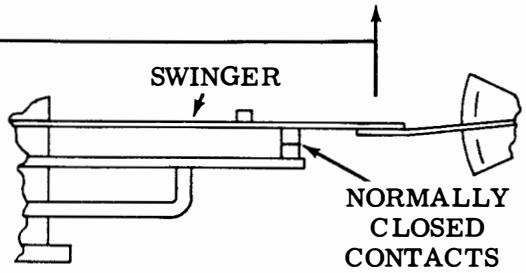
(1) Requirement
With swinger held away
Min 2 oz---Max 6 oz
to move lower contact leaf from backstop.

To Adjust
Bend lower leaf.

(2) Requirement
Min 30 grams---Max 40 grams
to open normally closed contacts.

To Adjust
Bend swinger.

Note 3: If it is necessary to bend backstop to obtain required tension, reposition backstop to meet NORMALLY CLOSED CONTACTS — BACKSTOP requirement.



(C) NORMALLY OPEN CONTACTS — GAP

Requirement
Min 0.010 inch---Max 0.015 inch
gap between normally open contacts.

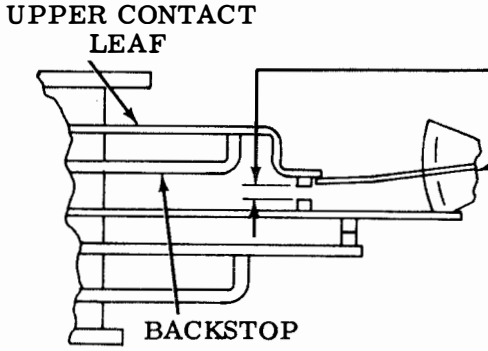
To Adjust
Bend associated backstop to meet requirement.

(D) NORMALLY OPEN CONTACTS — SPRING

Requirement
Min 30 grams---Max 40 grams
to move normally open contact away from backstop.

To Adjust
Bend upper contact leaf.

Note 4: If it is necessary to bend backstop to obtain required tension, reposition backstop to meet NORMALLY OPEN CONTACTS — GAP requirement.



(Front Views)

3.06 Code Reading Contacts (continued)

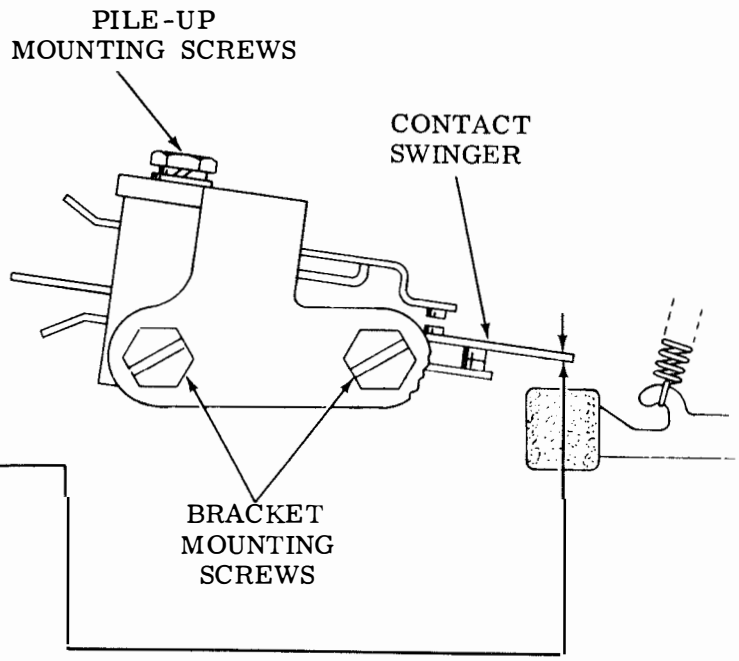
Note: Secondary adjustments should be made with code reading contact assembly installed in the transmitter distributor and with the contact assembly bracket approximately centered in its adjustment range. (Remove contact box to facilitate adjustment.)

(A) CONTACT ASSEMBLY POSITIONING

To Check
Align each swinger with its associated sensing arm. (Gauge by eye.)

Requirement
Swinger to be aligned with its sensing arm.

To Adjust
Loosen screws which mount the contact assembly to the contact bracket. Position the assembly to meet the requirement.



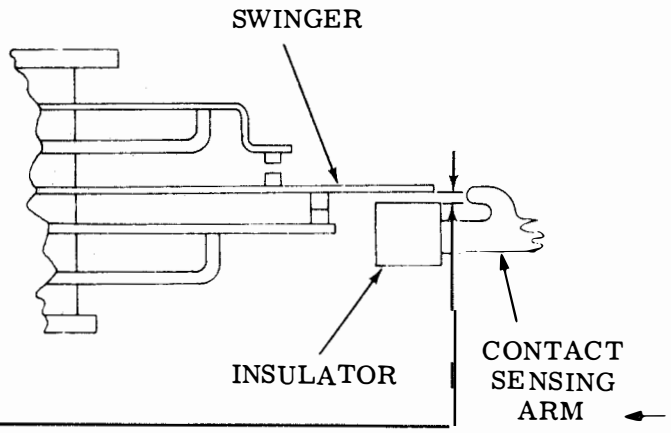
(Front Views)

(B) CONTACT SWINGER — SENSING ARM CLEARANCE

To Check
Place up-stop post out of the way and sensing arms in their uppermost positions. Select a BLANK combination.

Requirement
Min 0.015 inch---Max 0.025 inch gap between contact assembly swinger and insulator on contact sensing arm.

To Adjust
Loosen contact bracket mounting screws. Position bracket to meet the requirement. Tighten contact bracket mounting screws.



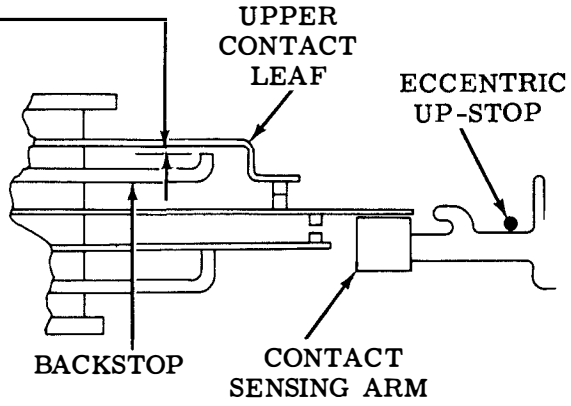
3.07 Code Reading Contacts (continued)

(A) CONTACT SENSING ARM — UP-STOP CLEARANCE

To Check
Rotate main shaft until sensing arms are in their highest positions. Engage clutch. Select a LETTERS combination.

Requirement
Min some---Max 0.008 inch clearance between upper contact leaf and its backstop.

To Adjust
Loosen nut that secures the eccentric up-stop to the front plate. Turn the eccentric to meet requirement. (High part of the eccentric should be toward the left.) Retighten eccentric nut.

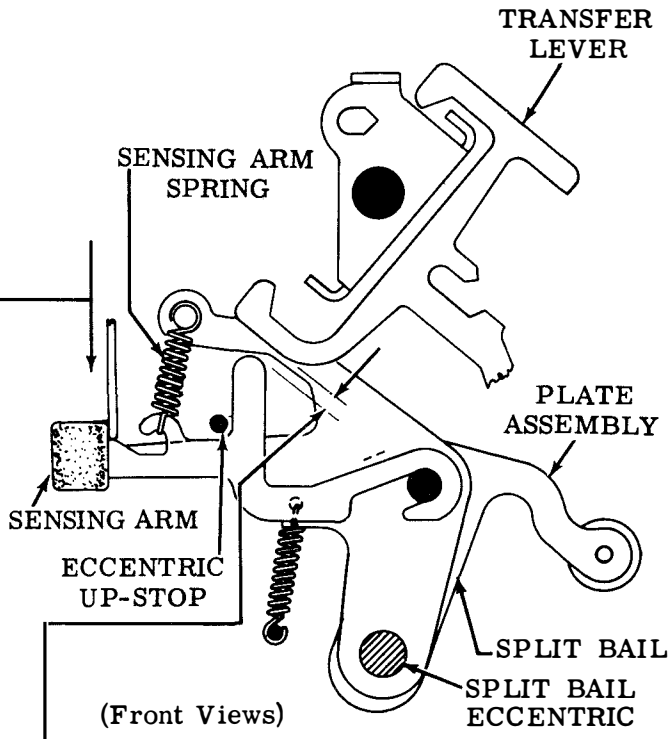


(B) SENSING ARM — TRANSFER LEVER ALIGNMENT

To Check
Trip clutch. Select BLANK combination.

Requirement
Sensing arms must engage a minimum of 2/3 of their respective transfer levers.

To Adjust
Add TP8896 shims between plate assembly and the split bail spacer to meet requirement. (Store remaining shims under flat washer at end of split bail eccentric screw.)



(Front Views)

(C) SENSING ARM SPRING

To Check
Disengage clutch.

Requirement
Min 2-1/2 oz---Max 3-1/2 oz to start sensing arm moving.

(D) SPLIT BAIL ECCENTRIC

To Check
Trip clutch. Select BLANK combination. Check clearance between closest transfer lever and its associated sensing arm.

Requirement
Min 0.005 inch---Max 0.010 inch

To Adjust
Loosen split bail eccentric locknut. Rotate split bail eccentric to meet requirement. Retighten locknut.

3.08 Code Reading Contacts (continued)

CONTACT SWINGER — SENSING ARM CLEARANCE (STROBING)

Note 1: When strobing the code reading contacts, use a DXD scale whose unit corresponds to that of the unit being checked. Refer to Contact Operating Requirements Table. The signal generator on the transmitter distributor must be synchronized with the DXD so that the end of the stop pulse image is in line with the end of the stop pulse on the DXD scale when transmission is continuous. Use a normal signal line direct current of 60 ma ±10% or 20 ma ±10% to strobe the contacts.

(1) Requirement
Contacts must open and close within the range specified on the Contact Operating Requirements Table.

(2) Requirement
Breaks in the pulses must be confined to the first and last 10 divisions of the trace.

CONTACT OPERATING REQUIREMENTS TABLE

Levels	Unit Code	Beginning Pulse			End of Pulse			Max. Pulse Length Osc (Div)
		Scale Segment	Scale Division	Tolerance (Div)	Scale Segment	Scale Division	Tolerance (Div)	
5	7.00	Pulse 1	25	±20	Pulse 5	15	±20	3
5	7.42	Pulse 1	30	±20	Pulse 5	40	±20	3
6	8.50	Pulse 0	45	±25	Pulse 5	5	±25	4

To Adjust
Loosen contact bracket mounting screws. Position bracket to meet requirements. Retighten contact bracket mounting screws.

Note 2: After making the adjustment, check clearance between contact swinger and insulator on the contact sensing arm when a BLANK combination has been selected and the main shaft rotated to place the sensing arms in their highest position. There must be some clearance. If the requirements cannot be met, recheck initial mechanical adjustments.

3.09 Auxiliary Contacts

Note: Make initial adjustments with the auxiliary contacts removed from the transmitter distributor unit.

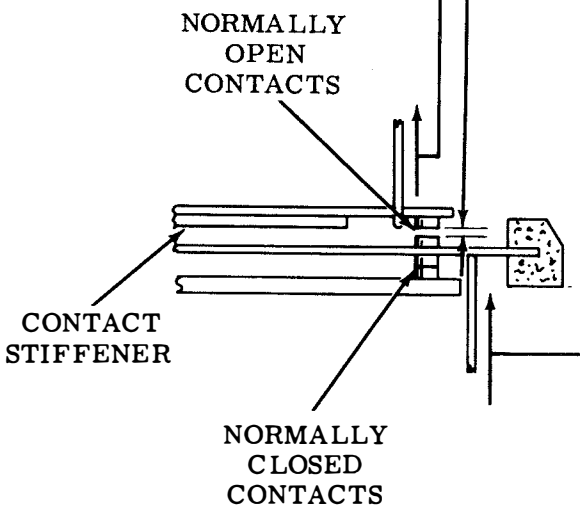
(A) NORMALLY OPEN CONTACTS

(1) Requirement
Min 5-1/2 oz---Max 6 oz
to move normally open contact away from stiffener.

To Adjust
Bend normally open contact leaf to meet requirement.

(2) Requirement
Min 0.015 inch---Max 0.020 inch
gap between normally open contacts.

To Adjust
Bend contact stiffener to meet requirements.



(Front View)

(B) NORMALLY CLOSED CONTACTS

Requirement
Min 4 oz---Max 5 oz
to open normally closed contact.

To Adjust
Bend swinger contact to meet requirement.

3.10 Auxiliary Contacts (continued)

Note: Make secondary adjustments with the auxiliary contacts installed in the transmitter distributor.

(A) CONTACT SENSING ARM

(1) To Check
Disengage and latch clutch. Check clearance between insulator on swinger and bail.

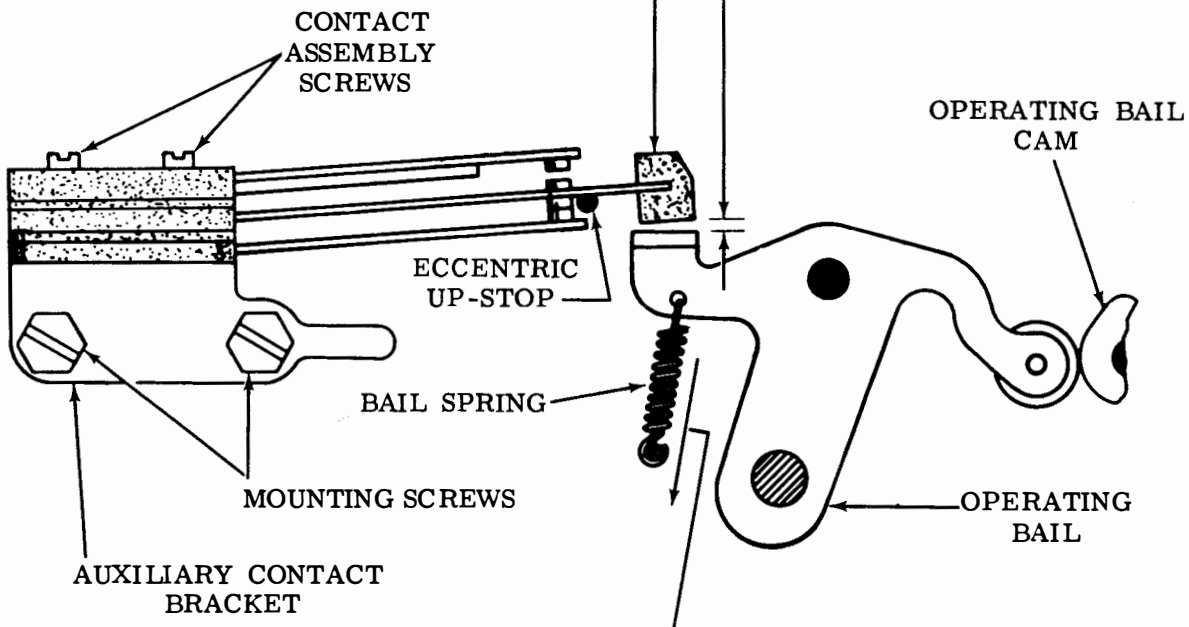
Requirement
Swinger insulator should be centrally located with respect to its operating bail.

To Adjust
Loosen contact assembly screws. Position swinger and contact springs. Retighten contact assembly screws.

(2) To Check
Check position of swinger with respect to its bail.

Requirement
Min 0.040 inch — Max 0.050 inch between insulator on swinger and its bail.

To Adjust
Loosen contact bracket mounting screws. Position contact bracket to meet requirement. Retighten contact bracket mounting screws.



(Front View)

(B) AUXILIARY CONTACT OPERATING BAIL SPRING

To Check
Disengage clutch.

Requirement
Min 5 oz---Max 7 oz to pull spring to its installed length.

3.11 Auxiliary Contacts (continued)

CONTACT SWINGER — OPERATING BAIL CLEARANCE

Note: When strobing the auxiliary contacts, use a DXD scale whose unit code corresponds to that of the unit being checked. (Refer to Contact Operating Requirements Table.) Synchronize the signal generator of the transmitter distributor with the DXD so that the end of the stop pulse image is in line with the end of the stop pulse on the DXD scale when transmission is continuous. Use normal direct current line signal of 60 ma ±10% or 20 ma ±10% to strobe the contacts.

Requirement

The contacts must open and close within the range specified in the Contact Operating Requirements Table.

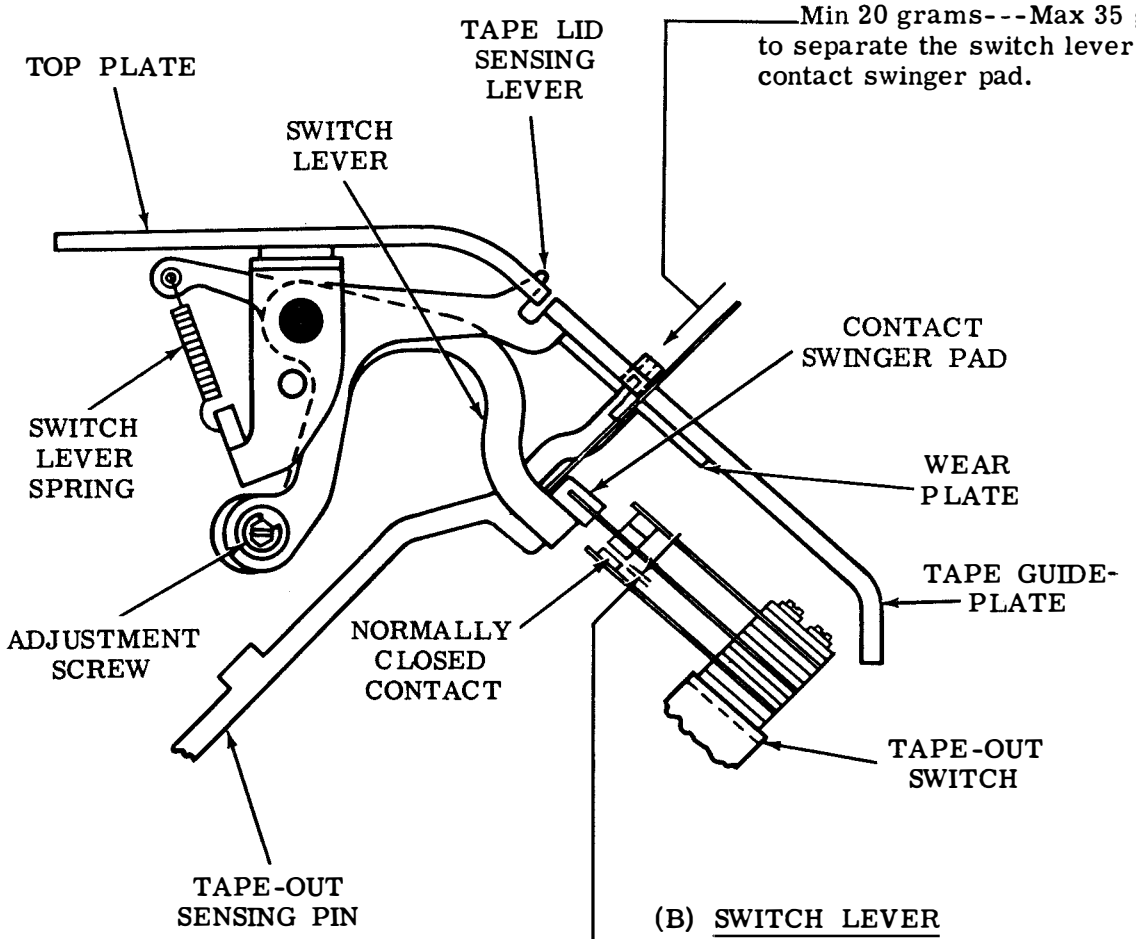
To Adjust

Loosen the contact bracket mounting screws. Position the contacts to meet the requirements. Retighten contact bracket mounting screws.

CONTACT OPERATING REQUIREMENTS TABLE

Levels	Unit Code	Start of Pulse			End of Pulse		
		Scale Segment	Scale Division	Tolerance (Div)	Scale Segment	Scale Division	Tolerance (Div)
5	7.00	Pulse 1	65	±15	Pulse 4	65	±15
5	7.42	Pulse 1	75	±15	Pulse 4	90	±15
6	8.50	Pulse 1	0	±20	Pulse 4	60	±20

3.12 Tape Lid Sensing Lever



(Front View)

(A) SWITCH LEVER SPRING

To Check
Open tape lid.

Requirement
Min 20 grams---Max 35 grams to separate the switch lever from the contact swinger pad.

(B) SWITCH LEVER

To Check
Open tape lid. Depress the tape-out sensing pin.

Requirement
Min 0.005 inch---Max 0.015 inch between the normally closed tape-out switch contacts.

To Adjust
Loosen the adjustment screw. With the tape lid sensing lever seated firmly against the tape guideplate, rotate the switch lever clockwise or counter-clockwise to meet requirement. Re-tighten adjustment screw.

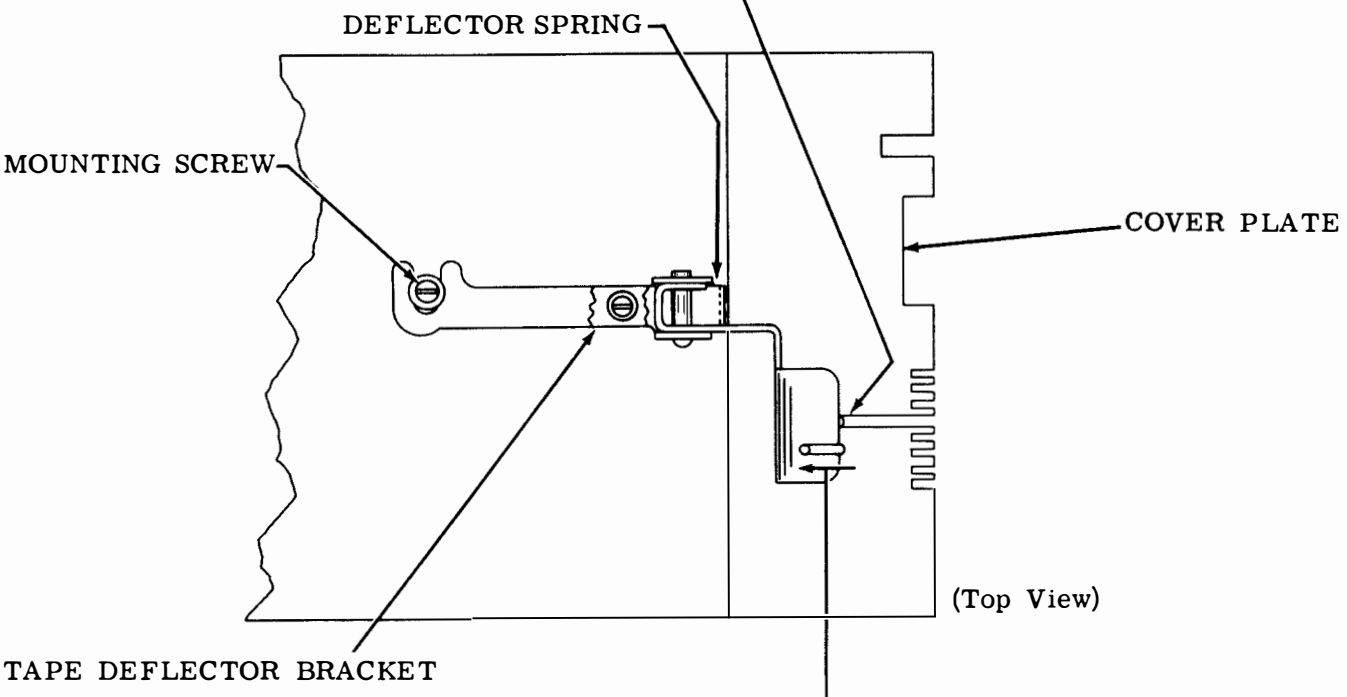
3.13 Tape Deflector

(A) TAPE DEFLECTOR BRACKET

To Check
Check position of deflector tang in relation to its hole in top plate when the unit is in its operating position.

Requirement
Deflector tang should be located centrally in its hole in the top plate.

To Adjust
Remove rear screw which secures tape deflector spring to the cover plate. Loosen forward screw. Position tape deflector. Replace rear screw, and tighten both forward and rear screws.



(B) TAPE DEFLECTOR SPRING

Requirement
Min 1-1/2 oz---Max 4 oz
to start the deflector moving from its operating position.

To Adjust
Loosen mounting screw. Position the spring using the enlarged mounting slot. Retighten mounting screw.

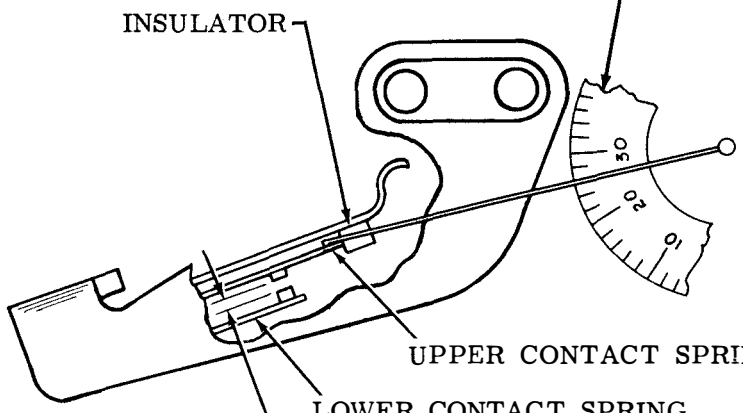
3.14 Start-Stop Pulse Contact

(A) CONTACT LEVER

To Check
Remove contact assembly from unit. Insure that no clearance exists between the contact lever and insulator.

Requirement
Min 20 grams---Max 30 grams to move insulator from contact operating lever.

To Adjust
Bend lower contact spring.



(B) CONTACT GAP (START AND STOP CONTACTS)

Requirement
Min 0.012 inch---Max 0.018 inch

To Adjust
Bend upper contact spring.

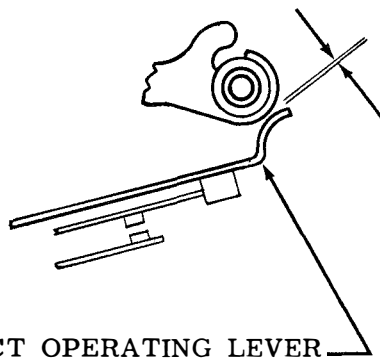
(Front Views)

(C) CONTACT BRACKET

To Check
Place unit in stop position. Latch clutch. Check clearance between contact operating lever and transfer lever.

Requirement
Min 0.012 inch---Max 0.018 inch

To Adjust
Loosen mounting bracket screws. Position contact assembly to meet requirement. Retighten mounting bracket screws. Replace contact assembly in unit.



3.15 Start-Stop Pulse Contact (continued)

CONTACT BRACKET (STROBING)

Note 1: When strobing auxiliary contacts, use a 7.42 unit DXD scale. Synchronize the signal generator of the transmitter distributor with the DXD so that the end of the stop pulse image is in line with the end of the stop pulse on the DXD scale when transmission is continuous. Use normal signal line direct current of 60 ma ± 10% or 20 ma ± 10% to strobe the contacts.

Requirement

Contacts must close within the following range.

	MIN CLOSURE	CLOSURE RANGE
STOP CONTACT	95 DIV	0 DIV OF STOP SEGMENT TO 142ND DIV OF STOP SEGMENT
START CONTACT	60 DIV	122ND DIV OF STOP SEGMENT TO 95TH DIV OF START SEGMENT

Note 2: Breaks are permissible within 5 divisions of the beginning or end of a trace.

To Adjust

Loosen contact bracket mounting screws. Position the contact bracket to meet requirements. Retighten contact bracket mounting screws.

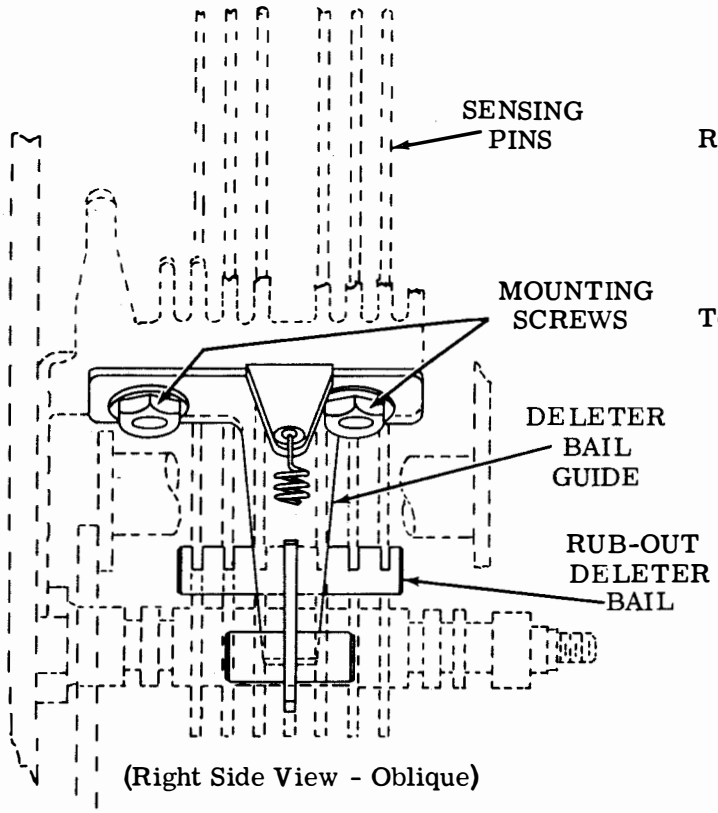
3.16 Rub-Out Deleter

(A) RUB-OUT DELETER BAIL GUIDE

To Check
Place sensing pins in their highest position. Check that deleter bail moves freely in its guide.

Requirement
When the rub-out permutation code is present, the rub-out deleter bail should rest against the lower projection of the sensing pin.

To Adjust
Loosen mounting screws friction tight. Position deleter bail guide. Retighten mounting screws.



(Right Side View - Oblique)

(B) SENSING PIN SPRING

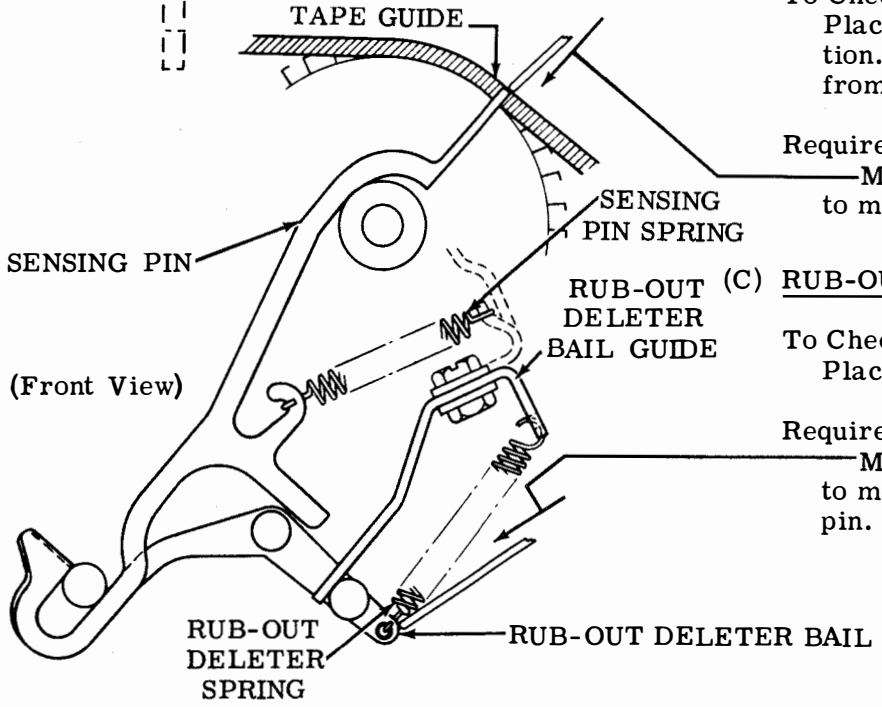
To Check
Place sensing pin in its highest position. Hold rub-out deleter bail away from the pin.

Requirement
Min 3 oz---Max 5 oz
to move pin flush with tape guide.

(C) RUB-OUT DELETER BAIL SPRING

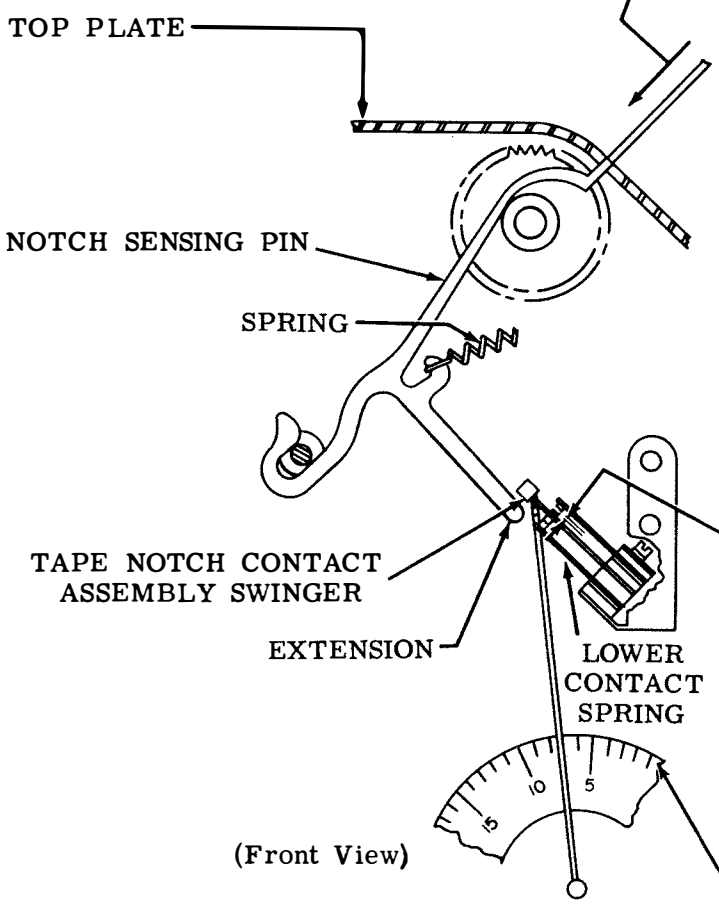
To Check
Place sensing pin in highest position.

Requirement
Min 1 oz---Max 2-1/2 oz
to move bail away from the sensing pin.



(Front View)

3.17 Tape Notch Sensing Mechanism



(A) TAPE NOTCH SENSING PIN SPRING

To Check
Place sensing pin in highest position.

Requirement
Min 1 oz---Max 3 oz
to push sensing pin flush with surface of top plate.

(B) TAPE NOTCH SENSING CONTACT

(1) To Check
Check the location of the insulator with relation to the extension on sensing pin.

Requirement
Insulator on swinger should be centrally located with respect to the extension on sensing pin.

To Adjust
Loosen contact assembly mounting screws. Position contact assembly to meet requirement. Retighten mounting screws.

(2) To Check
Place sensing pin flush with top plate. Check clearance between sensing pin extension and insulator of contact swinger. Check gap between normally open contacts.

Requirement
Min 0.008 inch---Max 0.015 inch

To Adjust
Bend swinger to meet requirement.

(3) To Check
Hold sensing pin extension away from swinger.

Requirement
Min 8 grams---Max 15 grams
to just separate normally closed contacts.

To Adjust
Bend lower contact spring to meet requirement.

3.18 Tape Notch Sensing Mechanism (continued)

CONTACT BRACKET (STROBING)

Note: When using the tape notch sensing contacts, use a 7.42 unit DXD scale. Synchronize the transmitter distributor so that the end of the stop pulse image is in line with the end of the stop pulse on the DXD scale when transmission is continuous. Use a normal direct current line signal of 60 ma ±10% or 20 ma ±10% to strobe these contacts.

(FOR UNITS WITH TAPE SLACK ARM)

(1) Requirement
The contact should open no earlier than the 15 mark of the first pulse and open no later than the 55 mark of the first pulse.

(2) Requirement
The contact should close no earlier than the 15 mark of the fifth pulse and close no later than the 55 mark of the fifth pulse.

(3) Requirement
Contact breaks will be permitted between the 15 mark and the 55 mark of the fifth pulse. The magnitude of the breaks must not extend beyond these limits.

To Adjust
Loosen bracket contact mounting screws. Position contact bracket to meet requirements. Retighten mounting screws.

(FOR UNITS WITHOUT TAPE SLACK ARM)

(1) Requirement
The contact should close no earlier than the 15 mark of the first pulse and close no later than the 55 mark of the first pulse.

(2) Requirement
The contact should open no earlier than the 15 mark of the fifth pulse and open no later than the 55 mark of the fifth pulse.

(3) Requirement
Contact breaks will be permitted between the 15 and 55 marks of the first pulse. The magnitude of the breaks must not extend beyond these limits.

To Adjust
Loosen bracket contact mounting screws. Position contact bracket to meet requirements. Retighten mounting screws.

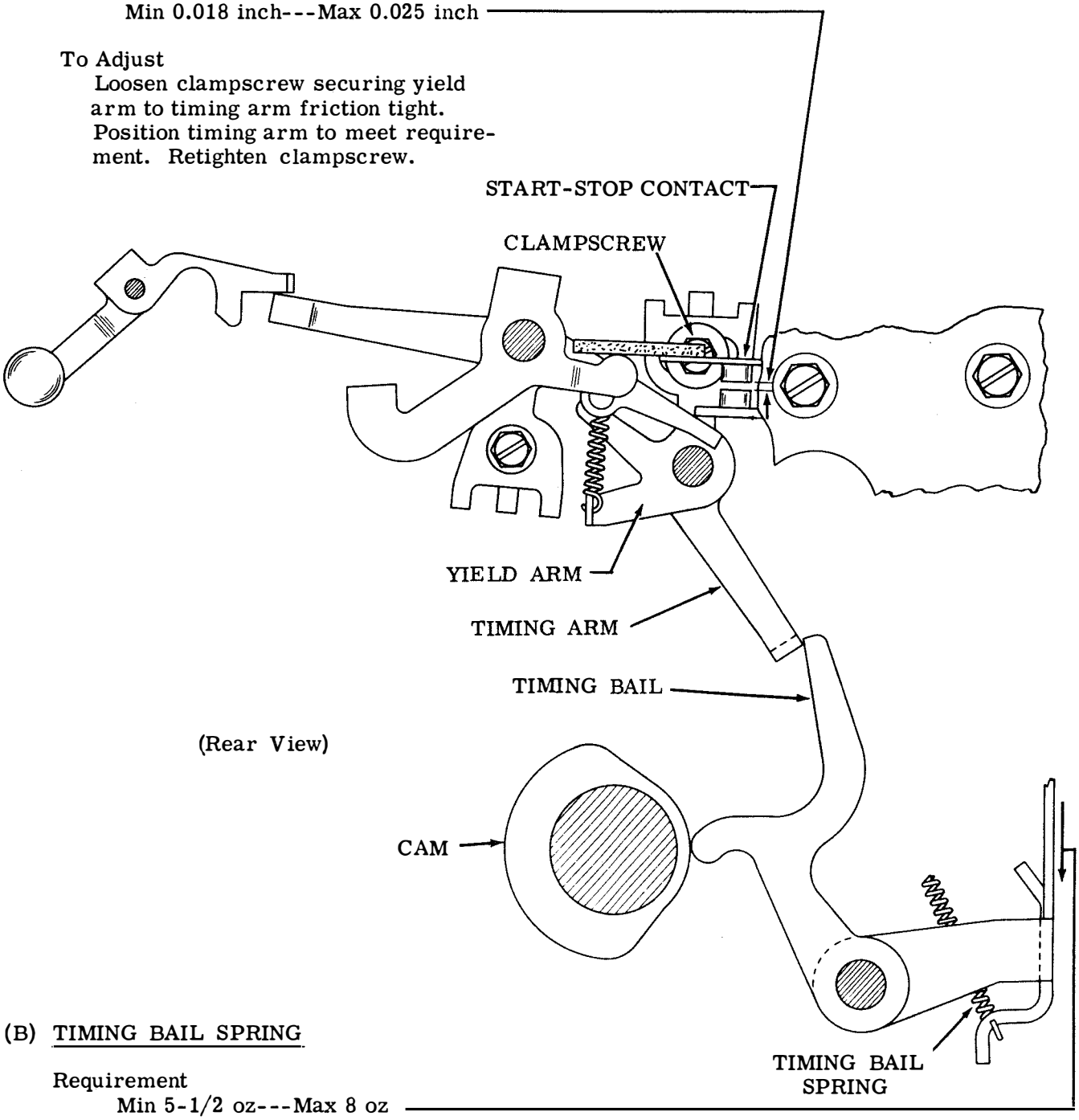
3.19 Transmitter Stop Mechanism

(A) START-STOP CONTACT GAP (FOR TABULATOR CONTROL)

To Check
Place timing bail on lower part of its cam. Check start-stop contact gap.

Requirement
Min 0.018 inch---Max 0.025 inch

To Adjust
Loosen clampscrew securing yield arm to timing arm friction tight. Position timing arm to meet requirement. Retighten clampscrew.



(Rear View)

(B) TIMING BAIL SPRING

Requirement
Min 5-1/2 oz---Max 8 oz to start the bail moving.

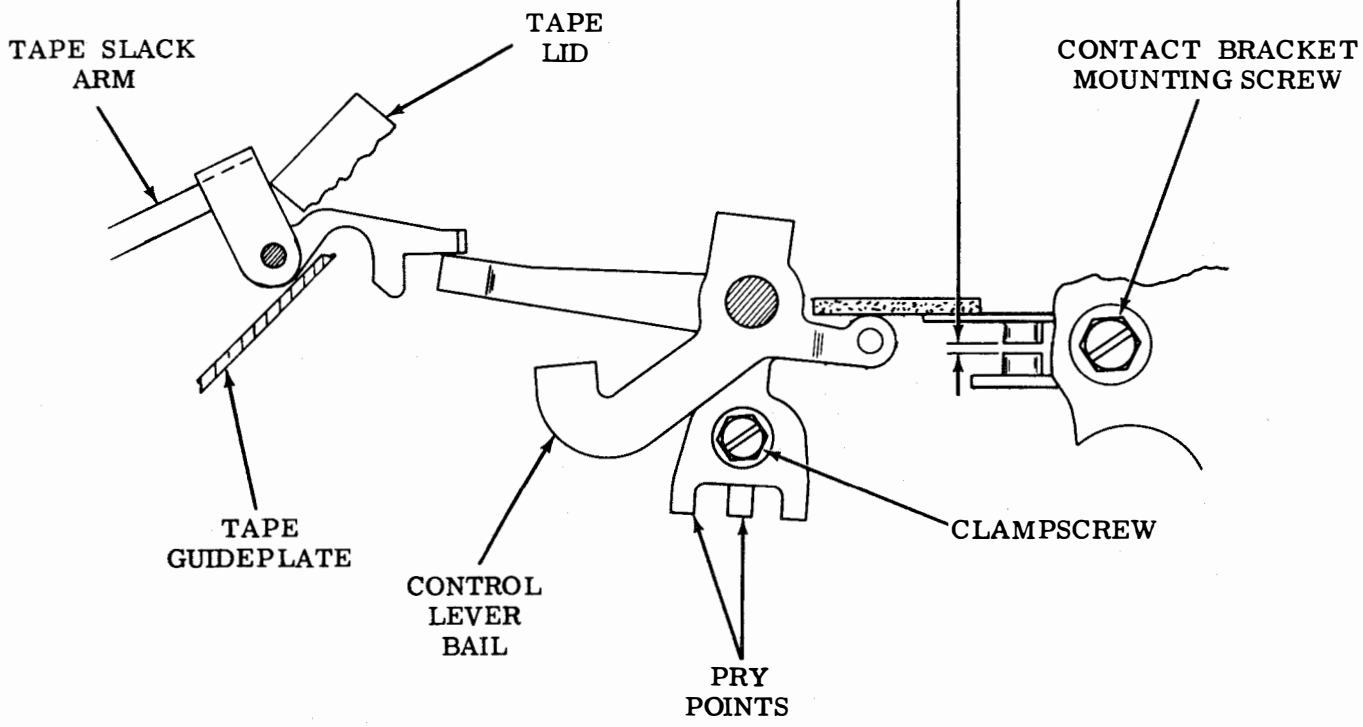
3.20 Tape Slack Arm

TAPE SLACK CONTACTS

To Check
Close tape lid. Place control lever in run position. Check clearance between contacts when tape slack arm is raised to its maximum height.

Requirement
Min 0.010 inch---Max 0.020 inch

To Adjust
Loosen clampscrew. Set contact gap by positioning pry points. Retighten clampscrew.



(Rear View)

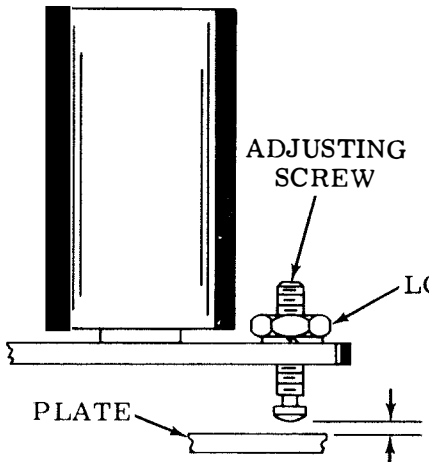
3.21 Tape Withhold Mechanism

(A) MAGNET ARMATURE GAP

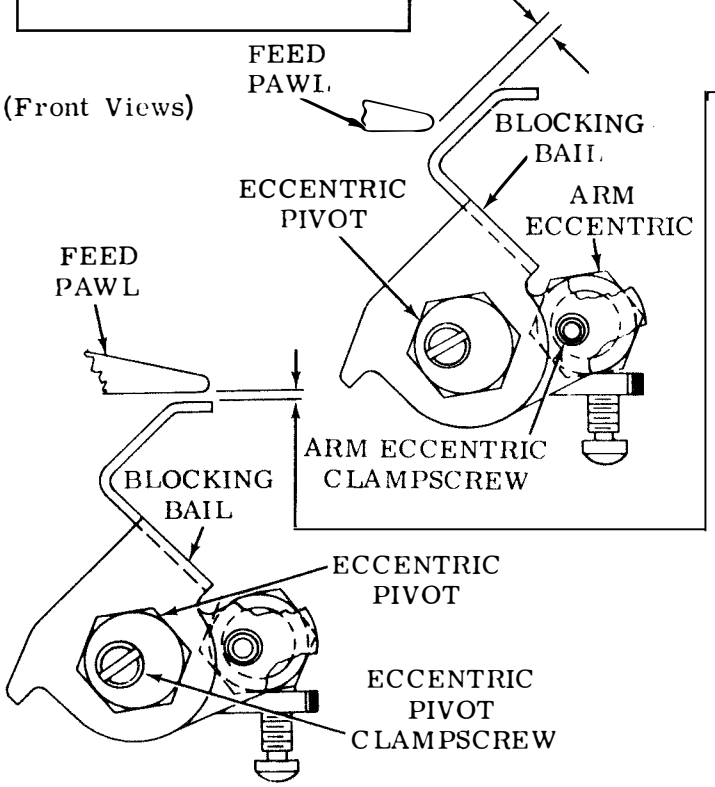
To Check
With the armature attracted, check the gap between the end of the armature adjusting screw and the plate.

Requirement
Min 0.025 inch---Max 0.035 inch

To Adjust
Loosen armature adjusting screw locknut friction tight. Rotate adjusting screw to meet requirement. Retighten locknut.



(Front Views)



(B) BLOCKING BAIL ARM ECCENTRIC

To Check
Place sensing pins in their lowest position. Place high part of block bail arm eccentric pivot to right at approximately the same angular position as the feed pawl eccentric.

Requirement
some clearance between the extension on the blocking bail and the tail of the feed pawl.

To Adjust
Loosen arm eccentric clampscrew. Rotate arm eccentric to meet requirement. Retighten clampscrew.

(C) BLOCKING BAIL ECCENTRIC PIVOT

To Check
Trip clutch. Hold armature attracted. Hold main shaft latched in stop position. Check clearance between blocking bail extension and feed pawl at closest point.

Requirement
Min 0.002 inch---Max 0.035 inch

To Adjust
Loosen eccentric pivot clampscrew friction tight. Rotate eccentric pivot to meet requirement. Retighten clampscrew.

Note 1: Check BLOCKING BAIL ARM ECCENTRIC adjustment, and refine if necessary.

Note 2: As a final check on this adjustment there should be some---to---0.015 inch clearance between the feed pawl and the feed ratchet at the closest point, as the feed pawl is cammed out of the ratchet during the blocking operation (magnet armature attracted). If necessary, refine BLOCKING BAIL ARM ECCENTRIC and BLOCKING BAIL ECCENTRIC PIVOT adjustments to meet this requirement.

4. EARLY MODELS

4.01 Tape Lid Mechanism

Note: Remove top and tape guideplate. Lubricate before adjustment.

TAPE LID

(1) To Check

Hold tape against notch in tape guideplate. Align feed wheel groove in tape lid with slot in plate. Align tape-out pin hole in plate tape lid with hole in plate. Check clearance between tape lid and pivot shoulder.

Requirement

Min some---Max 0.010 inch clearance between tape lid and pivot shoulder.

To Adjust

Loosen tape lid mounting nuts friction tight. Insert tip of TP156743 gauge through slot and into groove of lid. Position tape lid bracket. Retighten nuts.

(2) To Check

Tape lid front bearing surface should rest squarely against tape guideplate. Check rear bearing surface clearance.

Note: When both plates are assembled on unit, left edge of lid may touch top plate and some change in this clearance may be expected.

Requirement

Min some---Max 0.003 inch clearance between rear bearing surface and tape guideplate.

To Adjust

Loosen tape lid bracket mounting screws friction tight. Press tape lid against tape guideplate. Position bracket. Recheck requirement. Retighten bracket mounting screws.

(3) To Check

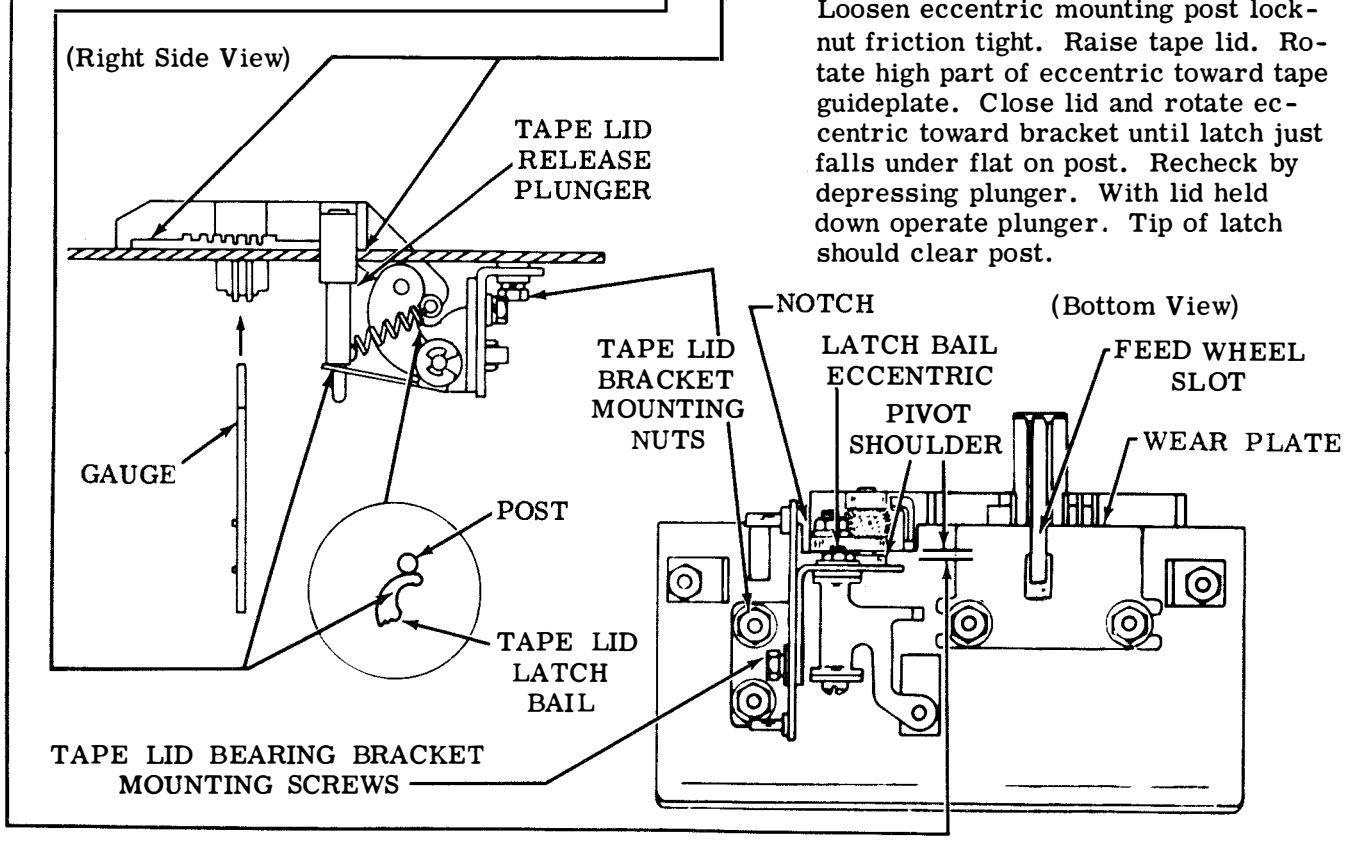
Latch tape lid against tape guideplate. Check release plunger for endplay.

Requirement

Some endplay when lid is latched against tape guideplate.

To Adjust

Loosen eccentric mounting post locknut friction tight. Raise tape lid. Rotate high part of eccentric toward tape guideplate. Close lid and rotate eccentric toward bracket until latch just falls under flat on post. Recheck by depressing plunger. With lid held down operate plunger. Tip of latch should clear post.

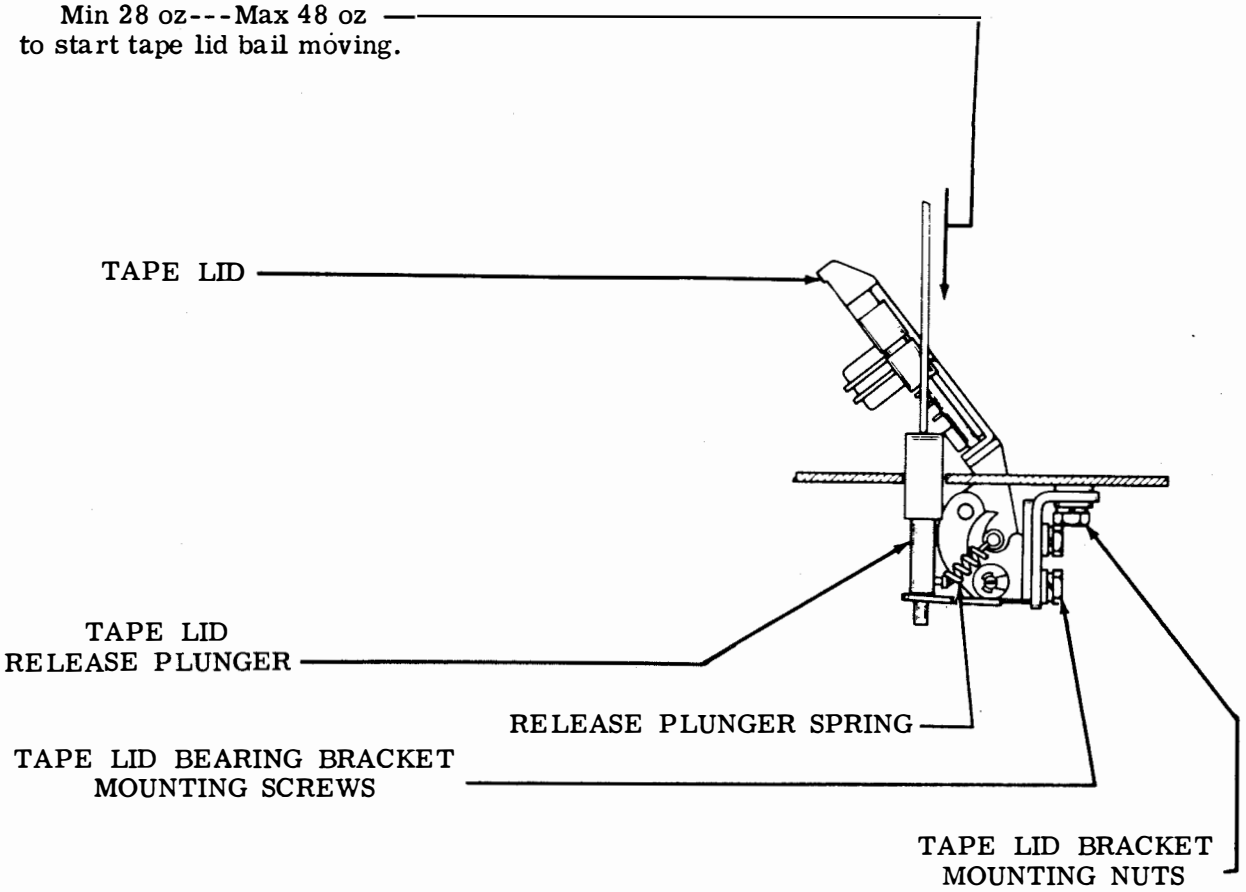


4.02 Tape Lid (continued)

TAPE LID RELEASE PLUNGER SPRING (For Units without Tape Lid Spring)

To Check
Hold tape guideplate horizontally. Unlatch tape lid.

Requirement
Min 28 oz---Max 48 oz to start tape lid bail moving.



(Right Side View)