

28 TRANSMITTER DISTRIBUTOR UNITS (LAXD, LCXD)

ADJUSTMENTS

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	2	Feed Lever	
2. ADJUSTMENTS	4	Feed lever set collar	12
Camshafts (LAXD)		Feed lever spring (fixed head) (LCXD)	12
Camshaft bearing retainer	5	Feed lever spring (pivoted head)	12
Cam sleeve endplay	5	Fully Enclosed Last Character Contact Switch	
Idle gear assembly	5	Last character contact assembly	33
Camshafts (LCXD)		Last character contact spring	33
Camshaft bearing retainer	4	Oil Reservoir	24
Cam sleeve endplay	4	Pivoted Sensing Head	
Idle gear assembly	4	Check pawl	29
Clutch Mechanism		Check pawl spring	29
Clutch shoe lever	9	Feed pawl (final)	29
Clutch shoe lever spring	8	Feed pawl (preliminary)	29
Clutch shoe spring	8	Sensing head pivot screws	28
Clutch trip lever upper extension	9	Tape deflector	28
Clutch Trip Mechanism		Tape deflector bracket	28
Armature bail spring	6	Tape retaining lid latch	30
Clutch armature air gap	6	Top plate	30
Clutch trip assembly mounting plate	6	Sensing and Storing Switch Mechanism	
Clutch latchlever spring	7	Contact lever slide	27
Clutch trip lever spring	7	Storing switch contact	27
Magnet bracket	7	Sensing Mechanism	
Coverplate Mechanism (LCXD)		Auxiliary lever spring	23
Coverplate	19	Latchlever spring	25
Coverplate detent spring	19	Latch stripper bail spring	14
Distributor Contact Mechanism		Pusher stripper bail spring	14
Cam follower lever spring	10	Pushlever	23
Distributor block assembly	11	Pushlever spring	25
Distributor cam follower guide	10	Sensing pins (LAXD)	23
Distributor contact gap	11	Sensing pins (pivoted and fixed heads) (LCXD)	22
Distributor rocker compression springs	10	Sensing pin springs (fixed head) (LCXD)	26
		Sensing pin springs (pivoted head)	26
		Tape-out (6th) pin spring	26

CONTENTS	PAGE
Start-Stop Switch Assembly (LCXD)	
Start-stop bail yield spring	41
Start-stop lever switch bracket.	41
Storing Switch Mechanism	
Contact lever slide springs	13
Storing switch assembly replacement	24
Storing switch contact alignment.	13
Storing switch contact lever extension springs	13
Storing switch guides	13
Tape Depressor and Last Character Contact Switch	
Last character switch contact springs.	32
Tape deflector spring	32
Tape depressor alignment	31
Tape depressor spring	32
Tape Feed Mechanism (LCXD)	
Feed pawl.	18
Feed pawl spring	18
Feed ratchet detent spring.	20
Feed wheel detent.	20
Tape Guideplate (LCXD)	
Tape guide	17
Tape guideplate	17
Tape Lid Mechanism (LCXD With Tape Lid Spring)	
Start-stop lever detent spring.	16
Tape lid	15
Tape lid release plunger spring	16
Tape lid spring	16
Tape-Out and Tape Lid Pin Mechanism (LCXD Without Start-Stop Lever)	
Tape lid pin.	36
Tape lid pin spring.	36
Tape-out and tape lid pin downstop	35
Tape-out and tape lid switch bracket.	35
Tape-out pin spring bracket.	35

CONTENTS	PAGE
Tape-Out and Tape Lid Switch (LCXD Without Start-Stop Lever)	
Instructions for removing tape-out and tape lid switch assembly	34
Tape-out and tape lid switch	34
Tape-Out Pin and Bail Assembly (LCXD With Start-Stop Lever)	
Tape-out bail yield spring	40
Tape-out extension bail spring	40
Tape-out pin spring	40
Tape-Out Switch Assembly (LCXD With Start-Stop Lever)	
Tape-out pin	39
Tape-out switch.	38
Tape-out switch bracket	39
Tight-Tape Switch Assembly (LCXD)	
Tight-tape arm	37
Tight-tape bail yield spring	37
Tight-tape switch.	37
Tight-tape switch bracket	37
Top Plate Assembly (LCXD)	
Top plate (fixed head)	21
3. TRANSMITTER DISTRIBUTOR CONTACT STROBING.	42
GENERAL.	42
LAXD CONTACT STROBING PROCEDURE — 1-CYCLE CAM.	43
LAXD CONTACT STROBING PROCEDURE — 2-CYCLE CAM.	51
LCXD CONTACT STROBING — PIVOTED AND FIXED HEAD	56
LCXD CONTACT STROBING — FIXED HEAD.	62
1. GENERAL	
1.01 This section contains the adjustment procedures for the maintenance of the LAXD and LCXD transmitter distributor units.	

This material provides complete adjusting information for maintenance of these units.

1.02 References to left, right, front, rear, up, down, etc, refer to the apparatus in its normal operating position as viewed from the operator's position in front of the unit. Parts are shown in an upright position unless otherwise indicated.

1.03 The cover may be removed for inspection of the unit. However, before any maintenance procedures are started, the unit should first be removed from its subbase to disconnect the power and to permit the unit to be turned bottom upward so that parts on the bottom of the unit are more accessible.

CAUTION: DISCONNECT POWER BEFORE MAKING ANY ADJUSTMENTS.

1.04 Where a 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.

Note: When rotating either the sensing shaft or distributor shaft 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 shaft to rotate freely, apply pressure on the lug of the clutch disc with a screwdriver to cause it to engage its latchlever and, thus, disengage the internal expansion clutch shoes to prevent them from dragging on the clutch drum.

1.05 The figures in this section show the adjusting tolerances, positions of moving parts, and spring tensions. The illustrations

are arranged so that the adjustments are arranged in the sequence that would be followed if a complete readjustment of the apparatus were being made. Where an illustration shows inter-related parts, the sequence that should be followed in checking the requirements and making the adjustments shown is indicated by the letters (A), (B), (C), etc.

Note: On all LAXD units having 2-cycle cams, both halves of the cam sleeve should be checked.

1.06 The spring tensions given are indicated values and should be checked with proper spring scales in the position indicated. The adjusting illustrations show the angle at which the scale should be applied when measuring spring tensions.

1.07 Unless otherwise indicated, the adjustments in this section are common to both transmitter distributor units.

1.08 Tools and spring scales required to perform the adjustments are not supplied as part of the equipment and are listed separately in Section 570-005-800TC.

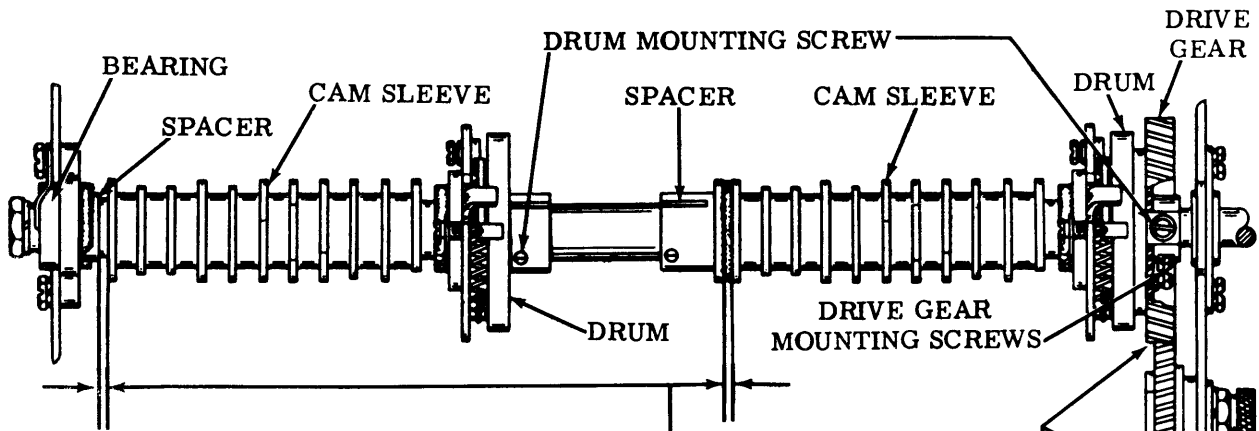
1.09 If a part that is mounted on shims is removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-up can be replaced when the part is remounted.

1.10 The technician should refer to the exploded views found in the appropriate parts literature for an illustration of the mechanism to be disassembled, for location and visual identification of parts, and detailed disassembly and reassembly features. The technician should read, and thoroughly understand, the procedures before making any adjustments.

2 ADJUSTMENTS

2.01 Camshafts (LCXD)

Note 1: The following requirements apply to both the distributor and sensing cam sleeves. These mechanisms should not be disturbed unless there is reason to believe the requirements are not met.



(A) CAM SLEEVE ENDPLAY

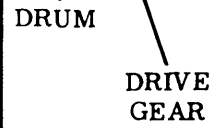
Requirement
 Min some---Max 0.010 inch
 play between cam sleeves and spacers.

To Adjust
 Remove clutch drum drive gear and loosen drum mounting screw. Disengage clutch and position cam sleeve. Tighten drum mounting screw and reinstall drive gear.

(C) IDLER GEAR ASSEMBLY

Requirement
 Clearance between idler gear and sensing shaft gear, and between idler gear and distributor shaft gear at point where backlash is minimum
 Min some---Max 0.003 inch

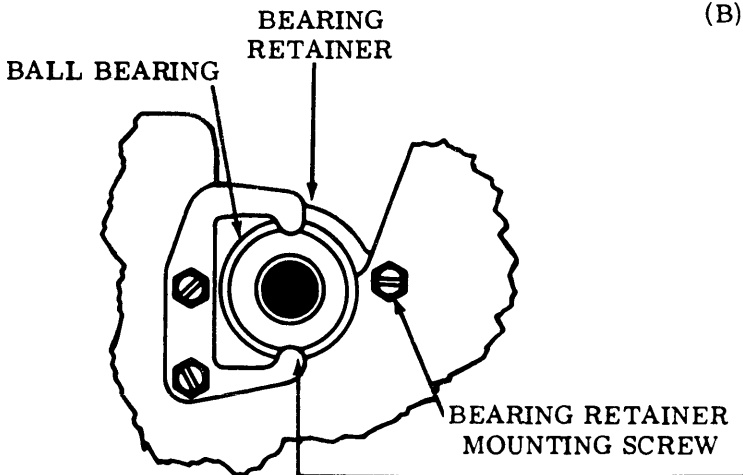
To Adjust
 Position idler gear assembly with locknut loosened. Recheck gear play through one revolution of gears.



(B) CAMSHAFT BEARING RETAINER

Requirement
 When mounting shaft assembly, bearing should seat properly. (No clearance permissible between bearing and mounting surface.)

To Adjust
 Rotate bearing retainer 180 degrees and position by pushing downward firmly.



2.02 Camshafts (LAXD)

Note: The following adjustments apply to both the distributor and sensing cam sleeves. These mechanisms should not be disturbed unless there is reason to believe the requirements are not met.

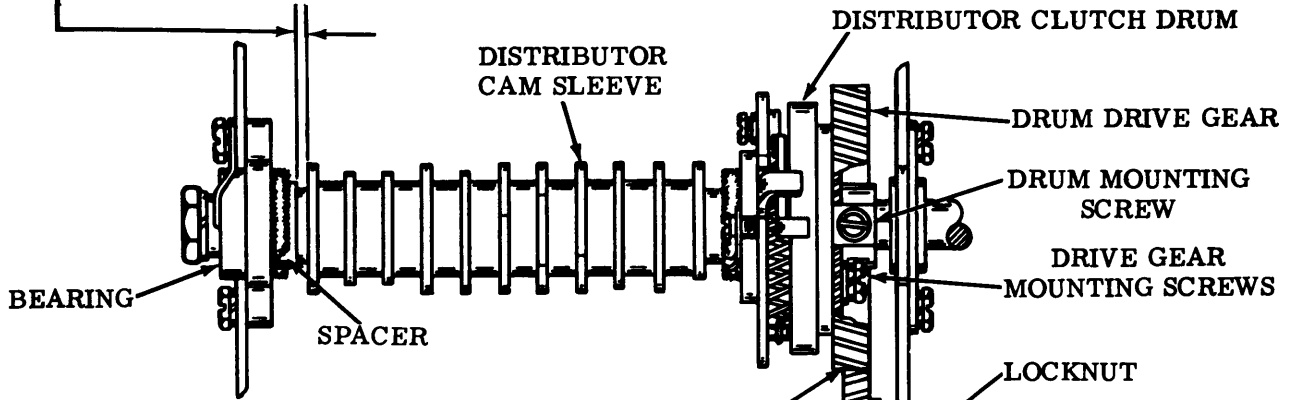
(A) CAM SLEEVE ENDPLAY

Requirement

Min some---Max 0.010 inch play between sleeve and spacer.

To Adjust

Remove clutch drum drive gear and loosen drum mounting screw. Disengage clutch and position cam sleeve. Tighten cam sleeve mounting screw and reinstall drive gear.



(C) IDLER GEAR ASSEMBLY

Requirement

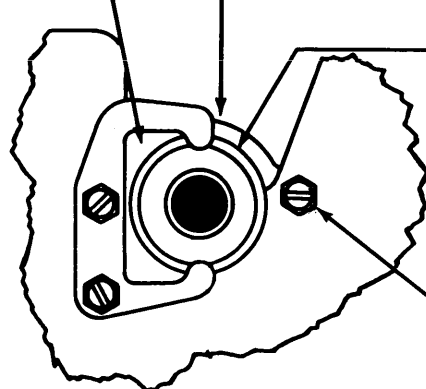
Clearance between idler gear and sensing shaft gear and between idler gear and distributor shaft gear at point where backlash is minimum

Min some---Max 0.003 inch

To Adjust

Position idler gear assembly with locknut loosened. Recheck gear play through one revolution of gears.

BALL BEARING BEARING RETAINER



(B) CAMSHAFT BEARING RETAINER

Requirement

When mounting shaft assembly, bearing should seat properly. (No clearance permissible between bearing and mounting surface.)

To Adjust

Rotate bearing retainer 180 degrees and position by pushing downward firmly.

2.03 Clutch Trip Mechanism

Note: Adjustments apply to both clutch trip mechanisms.

(A) CLUTCH ARMATURE AIR GAP

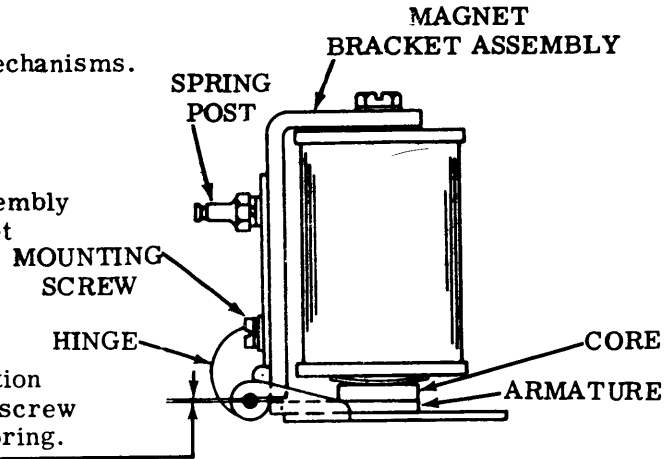
Requirement

Air gap between armature and magnet assembly bracket with armature flush against magnet core

Min 0.004 inch---Max 0.008 inch

To Adjust

Remove armature extension spring. Position hinge with spring post and hinge mounting screw loosened. Recheck air gap and replace spring.



(B) CLUTCH TRIP ASSEMBLY MOUNTING PLATE

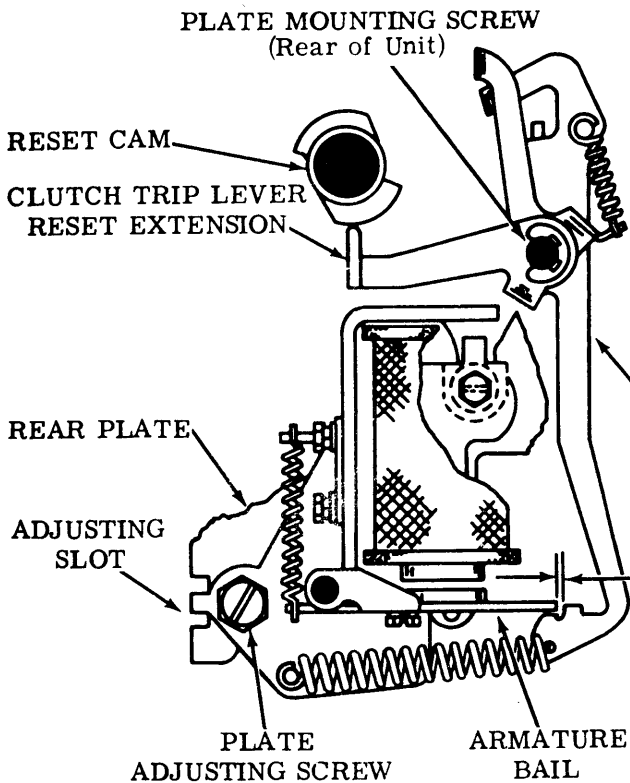
Requirement

Clearance between end of armature bail and latching surface of clutch trip lever lower extension with clutch trip lever reset extension on high part of cam. (Take up play in parts for minimum clearance.)

Min 0.020 inch---Max 0.030 inch

To Adjust

Position plate with screwdriver in lower adjusting slot with plate adjusting screw and plate mounting screw loosened. (Take up play in trip lever in direction of cam.)



CLUTCH TRIP LEVER LOWER EXTENSION

(C) ARMATURE BAIL SPRING

Requirement

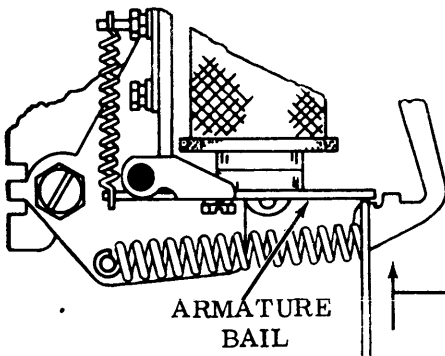
Invert unit. Trip clutch magnet and rotate shaft manually until trip lever reset extension is on high part of its cam.

For LCXD unit

Min 3 oz---Max 4-1/2 oz

For LAXD unit

Min 2-1/2 oz---Max 4-1/2 oz to start armature bail moving.



2.04 Clutch Trip Mechanism (continued)

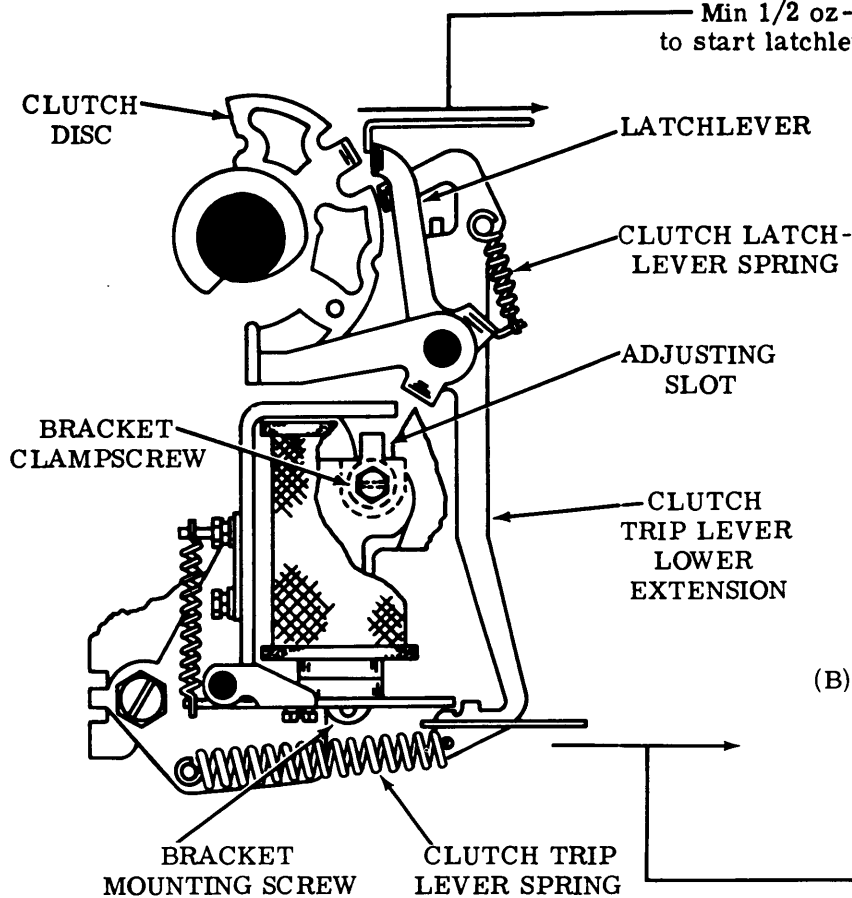
Note: Adjustments apply to both clutch trip mechanisms.

(A) CLUTCH LATCHLEVER SPRING

Requirement

Clutch latchlever on low part of clutch disc and unit upright. Scale applied to bent ear of latchlever horizontally.

Min 1/2 oz --- Max 1-1/2 oz
to start latchlever moving.



(B) CLUTCH TRIP LEVER SPRING

Requirement

With clutch just tripped, hold armature against core. Scale applied to trip lever lower extension in line with spring.

Min 2 oz --- Max 3-1/2 oz
to start trip lever lower extension moving.

(C) MAGNET BRACKET

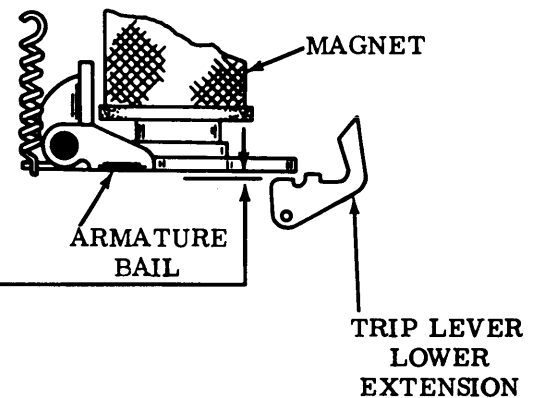
Requirement

Clearance between armature bail and top edge of trip lever lower extension with clutch trip lever reset extension on high part of cam and armature flush against core. (Take up play for minimum clearance.)

Min 0.030 inch --- Max 0.040 inch

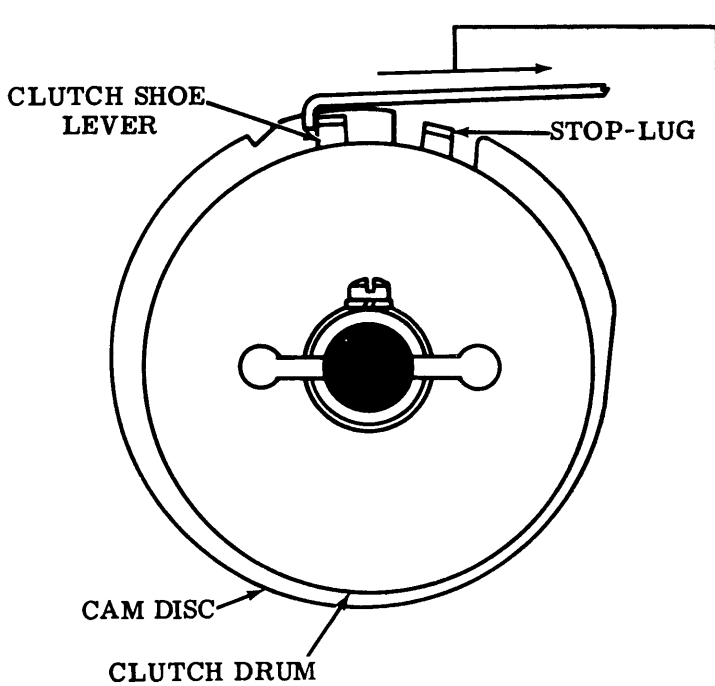
To Adjust

Insert screwdriver in upper slot and pivot bracket, with bracket mounting screw and clampscrew loosened.



2.05 Clutch Mechanism

Note 1: Adjustments (A) and (B) are adjusted at the factory and should not be disturbed unless associated mechanisms have been removed for servicing or there is reason to believe that the requirements are not met. The following adjustments apply to both the sensing clutch and distributor clutch.

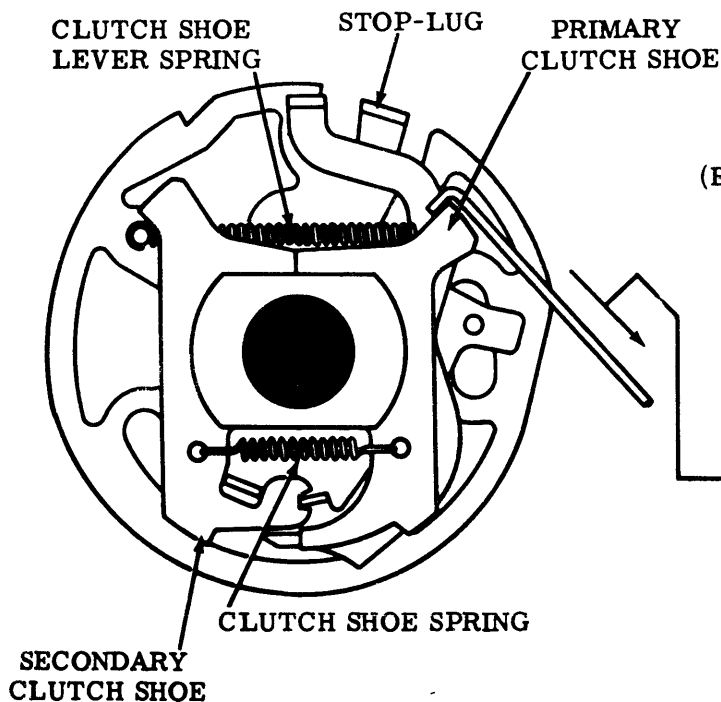


(A) CLUTCH SHOE LEVER SPRING

Requirement

Clutch engaged and cam disc held to prevent turning. Scale pulled at tangent to clutch.

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



(B) CLUTCH SHOE SPRING

Note 2: It is necessary to remove the clutch from the main shaft to facilitate this check.

Requirement

Clutch drum removed. Scale applied to primary shoe at a tangent to the friction surface.

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

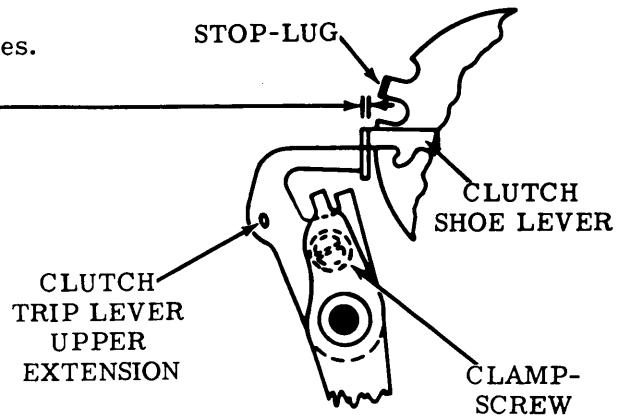
2.06 Clutch Mechanism (continued)

Note 1: Adjustments (A) and (B) apply to all clutches.

(A) CLUTCH TRIP LEVER UPPER EXTENSION

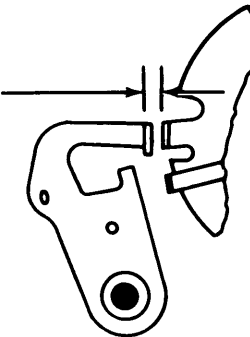
- (1) Requirement
Clutch trip lever latched (clutch in stop position). Clutch trip lever upper extension should fully engage clutch shoe lever.

To Adjust
Position upper extension, with clutch trip lever clampscrew loosened.

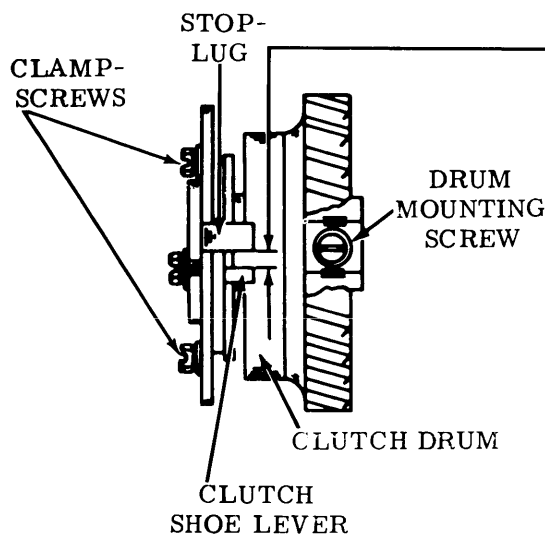


- (2) Requirement
With armature in attracted position, there should be some clearance between clutch trip lever upper extension and stop-lug when clutch is rotated to make clearance a minimum.

To Adjust
Refine Requirement (1), if necessary, so that clutch trip lever upper extension is under or over flush with stop-lug by not more than 0.015 inch.



(B) CLUTCH SHOE LEVER



- Requirement
Gap between clutch shoe lever and its stop-lug should be 0.055 inch to 0.085 inch greater when clutch is engaged than when clutch is disengaged.

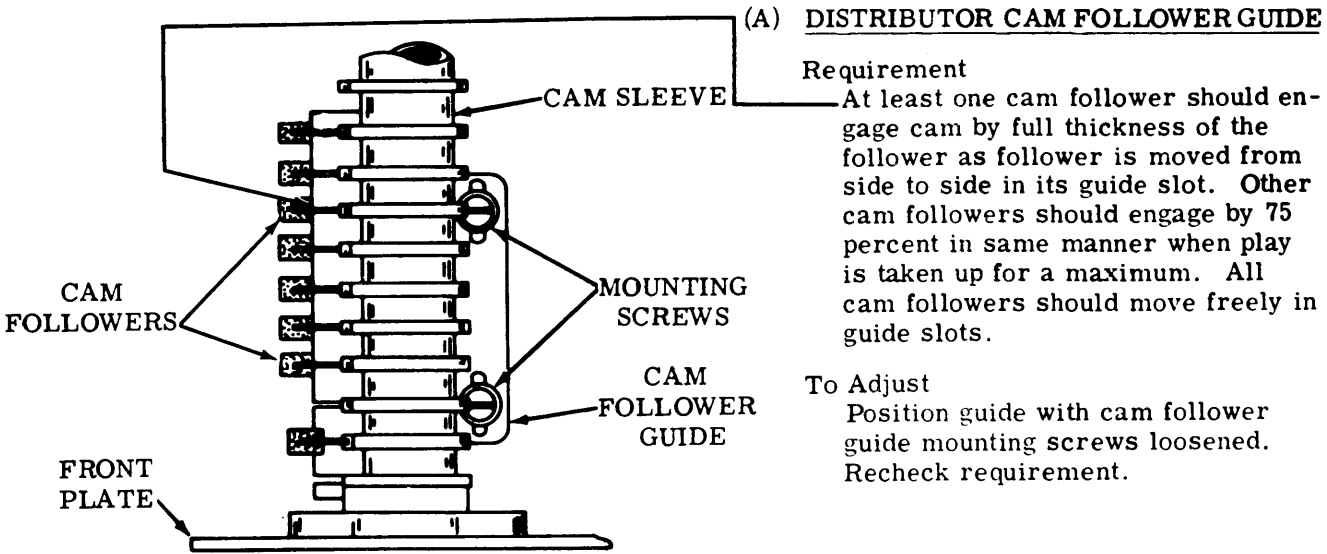
Note 2: If this unit is to operate at 60 wpm, gap should be 0.055 to 0.065 inch.

To Adjust
Engage a wrench or screwdriver on a screw on the adjusting disc. Rotate disc with clampscrews loosened and clutch disengaged.

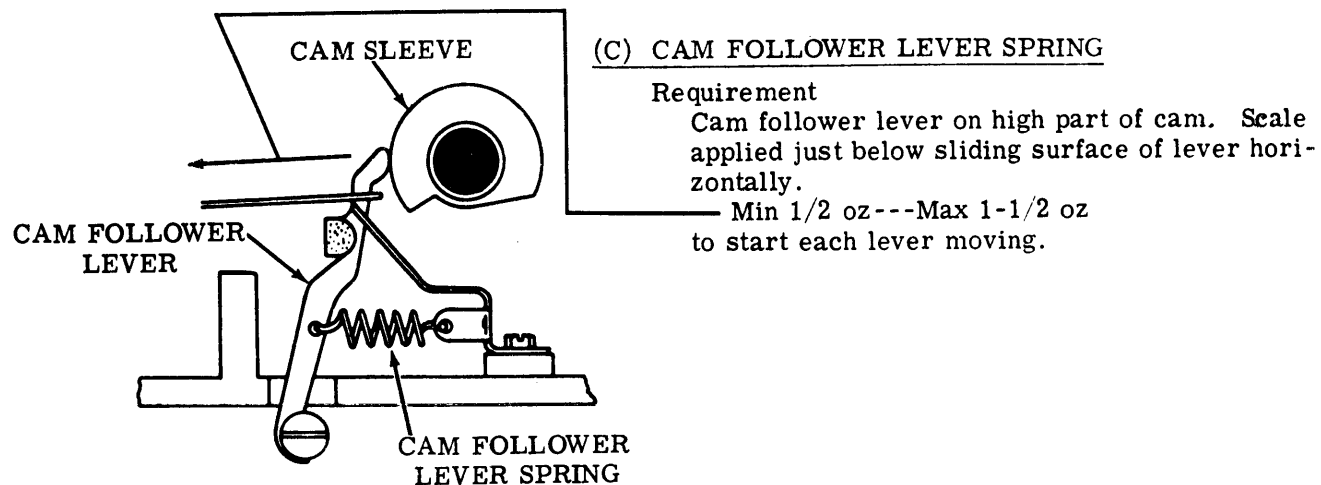
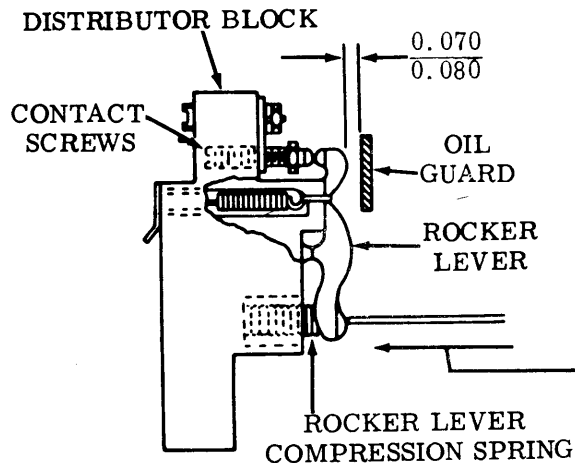
Note 3: After adjustment, disengage clutch, remove drum mounting screw and rotate drum in its normal direction of rotation to make certain that it does not drag on shoe. If drum drags, refine CLUTCH SHOE LEVER adjustment.

2.07 Distributor Contact Mechanism

Note 1: Remove oil reservoir and distributor block assembly for following adjustments.



Note 2: With distributor block removed, adjust contacts so that there is 0.070 to 0.080 inch between rocker levers and oil guard.



2.08 Distributor Contact Mechanism (continued)

Note 1: Replace distributor block.

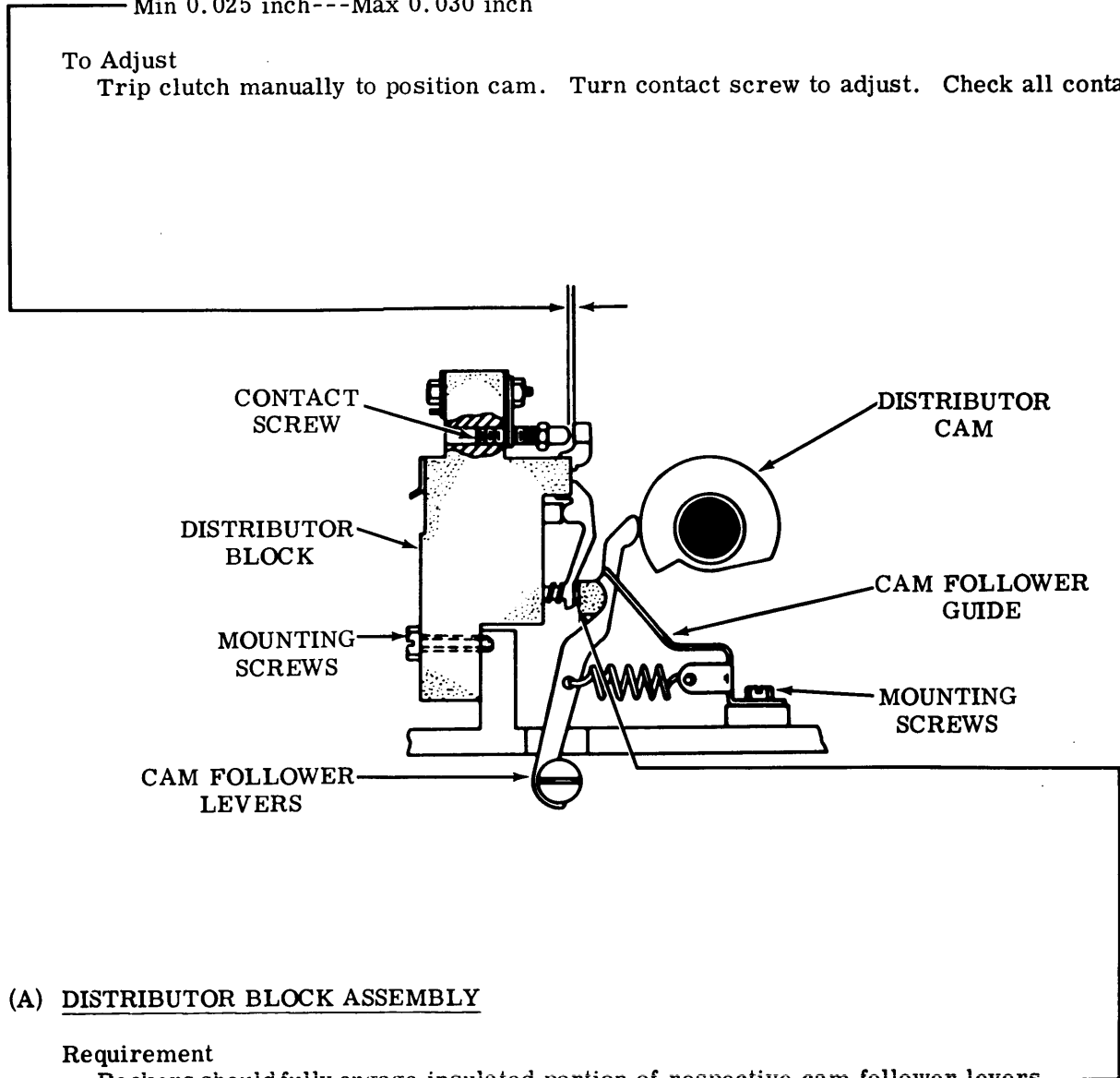
(B) DISTRIBUTOR CONTACT GAP

Requirement

Contact gap with cam follower lever on high part of cam
Min 0.025 inch---Max 0.030 inch

To Adjust

Trip clutch manually to position cam. Turn contact screw to adjust. Check all contacts.



(A) DISTRIBUTOR BLOCK ASSEMBLY

Requirement

Rockers should fully engage insulated portion of respective cam follower levers.

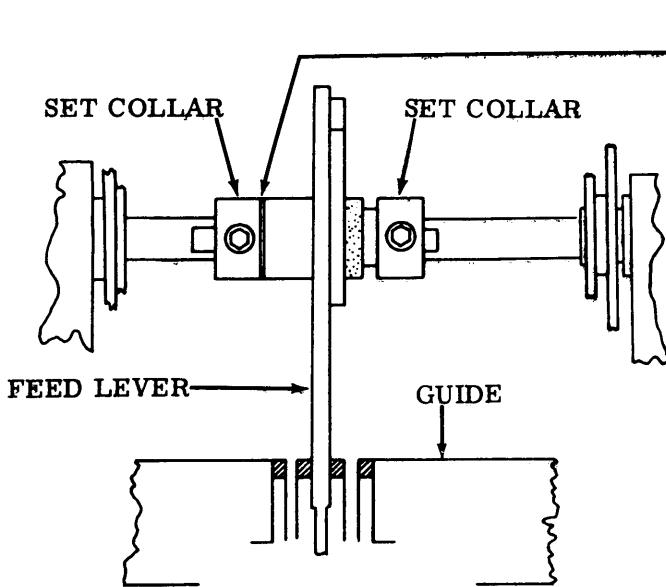
To Adjust

Position block with distributor block mounting screws loosened.

Note 2: For refinement of distributor contact adjustments, refer to distributor and transmitter contact strobing.

2.09 Feed Lever

(A) FEED LEVER SET COLLAR



Requirements

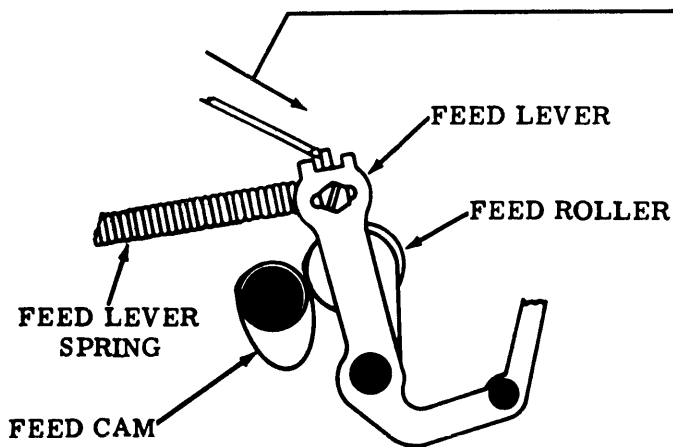
Min some---Max 0.015 inch clearance between feed lever and collar when feed lever is free in its guide slot.

To Adjust

Position feed lever with set collar screws loosened. Feed lever should move freely without binding at guide or collars.

Note: After tightening setscrews, re-check adjustment for binds between feed lever and collars, and between feed lever and guide.

(B) FEED LEVER SPRING (PIVOTED HEAD)



To Check

Trip sensing clutch. Rotate shaft until roller is off feed cam. Apply scale to feed lever.

Requirement

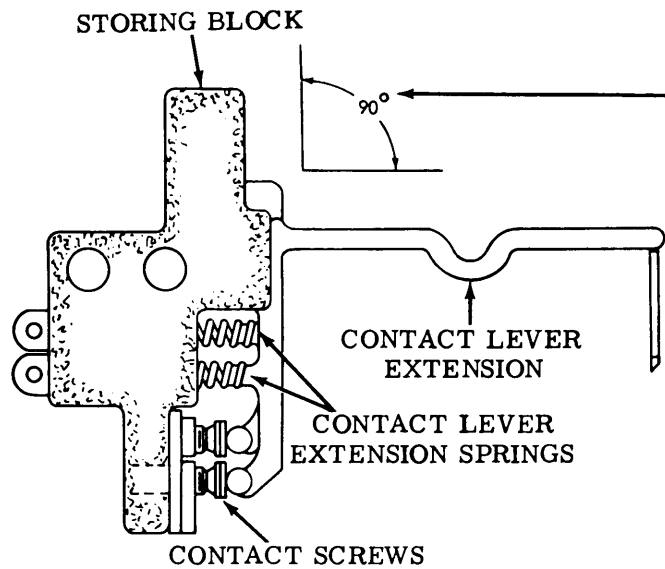
Min 30 oz---Max 40 oz to start feed roller moving away from cam.

FEED LEVER SPRING (FIXED HEAD)
(LCXD)

Requirement

With sensing clutch in stop position
Min 10 oz---Max 17 oz to move feed lever away from its cam surface.

2.10 Storing Switch Mechanism



(A) STORING SWITCH CONTACT ALIGNMENT

To Check
Remove storing switch assembly.

Requirement
Contact lever extensions should be perpendicular to storing block.

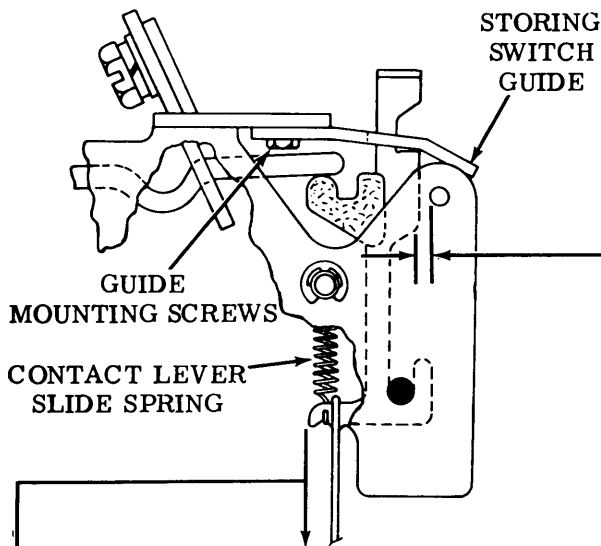
To Adjust
Turn each contact screw with hex wrench. Gauge by eye.

(B) STORING SWITCH CONTACT LEVER EXTENSION SPRINGS

(1) Requirement
Min 1-3/4 oz --- Max 3-1/2 oz
to start each contact lever extension moving.

(2) Requirement
Min 1/2 oz --- Max 1 oz
to start tape-out (6th) contact lever extension moving.

(C) STORING SWITCH GUIDES



Note 1: Before switch assembly is secured to unit, rotate slide eccentric to make clearance between slide stop post and end contact lever slides minimum.

(1) Requirement
Min 0.005 inch --- Max 0.012 inch
clearance between end slides and stop post.
(Hold slides away from stop post.)

Note 2: After CONTACT LEVER SLIDE (2.24) adjustment, clearance may be 0.005 to 0.015 inch.

(2) Requirement
Contact lever slides free in guide slots and parallel to side plates (gauge by eye).

To Adjust
Position guide with its mounting screws loosened.

(D) CONTACT LEVER SLIDE SPRINGS

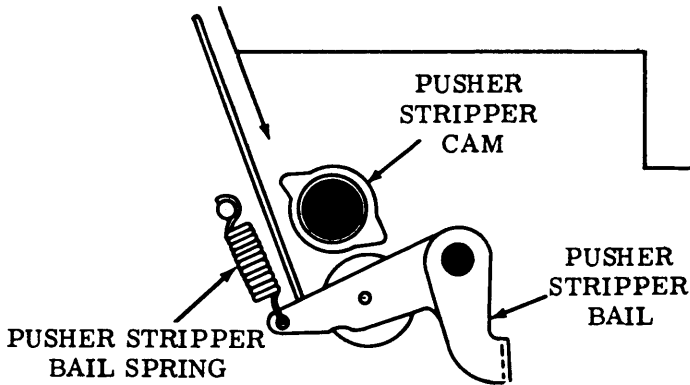
To Check
Select blank combination, trip sensing clutch, and rotate shaft to stop position. Hold extension levers away.

(1) Requirement
Min 4 Oz --- Max 6 oz
to start each contact lever slide moving.

(2) Requirement
Min 1-1/2 oz --- Max 3 oz
to start tape-out (6th) lever slide moving.

2.11 Sensing Mechanism

PUSHER STRIPPER BAIL SPRING



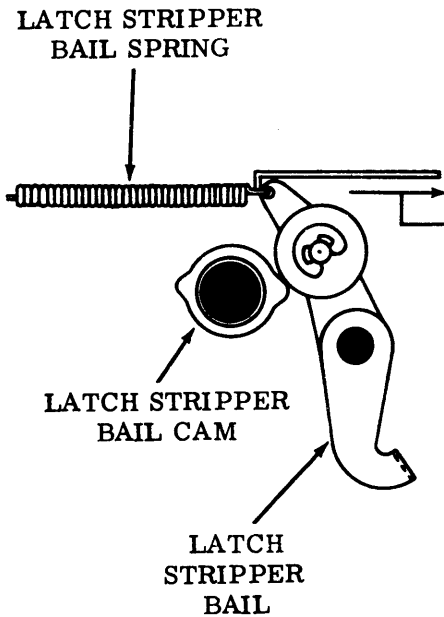
Requirement

With unit upright, select blank combination, trip clutch, and rotate shaft to stop position. 32 oz scale applied to point just below spring anchor.

Min 7 oz --- Max 11 oz
to start bail moving away from cam.

Note: Install oil reservoir before making the LATCH STRIPPER BAIL SPRING adjustment.

LATCH STRIPPER BAIL SPRING



To Check

Trip clutch, rotate shaft so latch bail follower roller is on low part of cam. Apply scale to top of latch stripper bail.

Requirement

Min 2-3/4 oz --- Max 6 oz
to start latch stripper bail moving.

2.12 Tape Lid Mechanism (LCXD with Tape Lid Spring)

TAPE LID

Note 1: Remove top and tape guideplates. Lubricate mating surfaces prior to adjustment.

(1) Requirement

Min some---Max 0.010 inch
clearance between pivot shoulder and tape lid when lid is pressed against notch in tape guideplate, and feed wheel slots and tape-out pin holes are lined up.

To Adjust

Loosen tape lid bracket mounting nuts. Using a TP156743 gauge, line up feed wheel groove in tape lid with slot in tape guideplate. Position tape lid bracket to meet requirement.

(2) Requirement

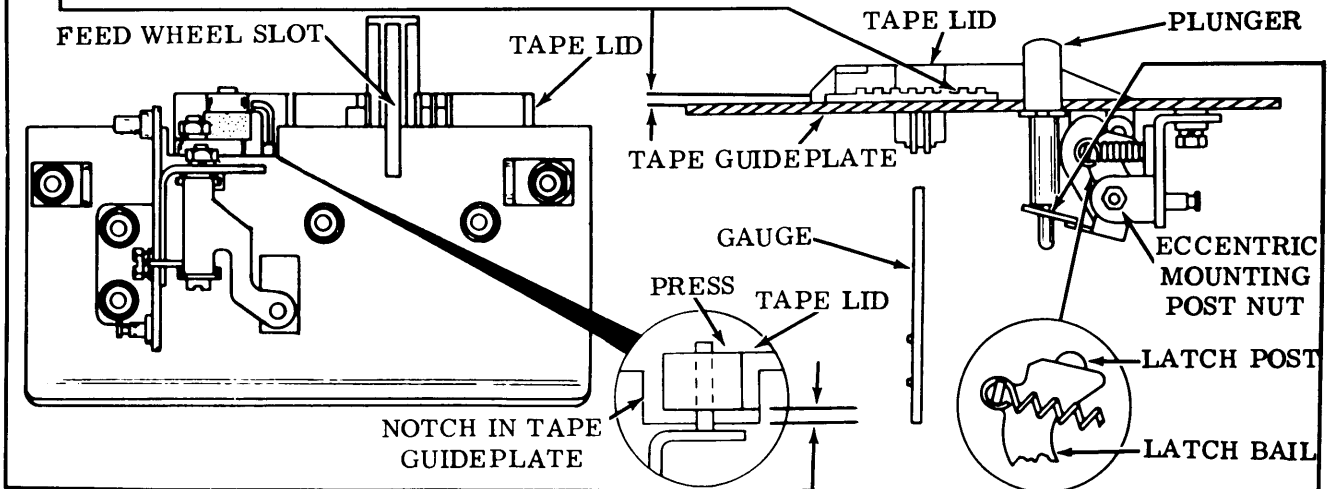
With tape lid front bearing surface touching tape guideplate, clearance between tape lid and tape guideplate

Min 0.010 inch---Max 0.018 inch
measured at tape lid fin in line with rear tape guide (2nd fin from rear).

Note 2: When both top and tape guideplates are assembled on unit, left edge of lid may touch top plate and some change in this clearance may be expected.

To Adjust

With tape lid bearing bracket mounting screws friction tight, and tape lid pressed against tape guideplate, position bearing bracket. Recheck Requirement (1).



(3) Requirement

Some endplay in release plunger when lid is latched against tape guideplate.

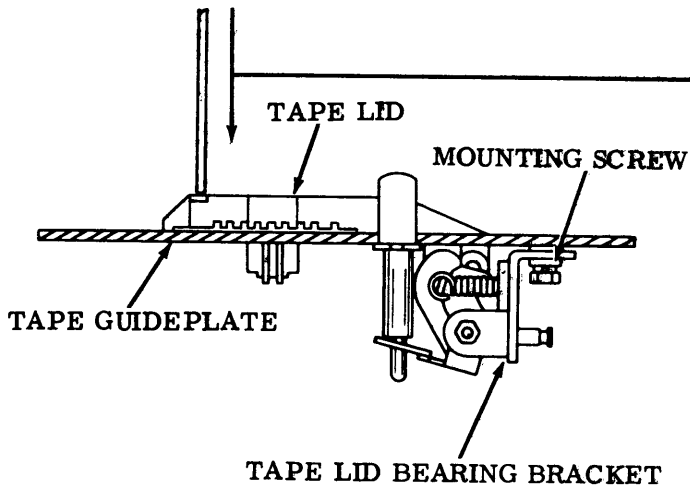
To Adjust

With eccentric mounting post nut friction tight and tape lid raised, rotate high part of eccentric post towards mounting bracket. Close tape lid. Rotate eccentric counterclockwise (as viewed from slotted end of eccentric post) until flat of latch post fully engages latch bail flat. Rotate eccentric clockwise to take up all play in parts, and to seat open end of tape lid against tape guideplate.

To Check

With tape lid held down manually, latch tip should clear latch post when release button is operated. With tape lid latched, tip of latch should project beyond flat of latch post, and there should be some endplay in release button.

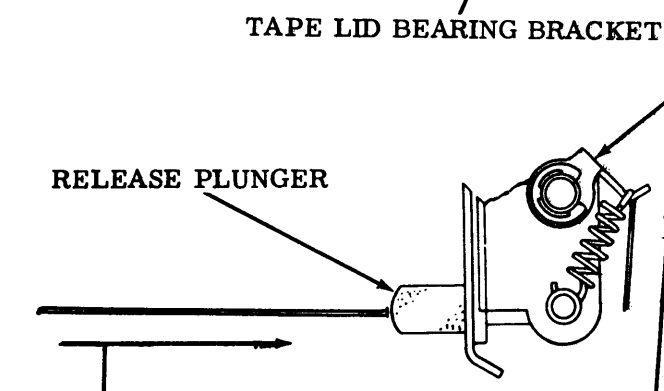
2.13 Tape Lid Mechanism (LCXD with Tape Lid Spring) (continued)



TAPE LID SPRING

To Check
 Open tape lid. Hold unit so tape guideplate is horizontal. Apply scale at top of lid immediately left of tape-out pin hole. Hold plunger fully depressed.

Requirement
 Min 3 oz --- Max 4-1/2 oz
 to move open end of tape lid against tape guideplate.



START-STOP LEVER
 DETENT BAIL

START-STOP LEVER DETENT SPRING

To Check
 Place start-stop lever in run position.

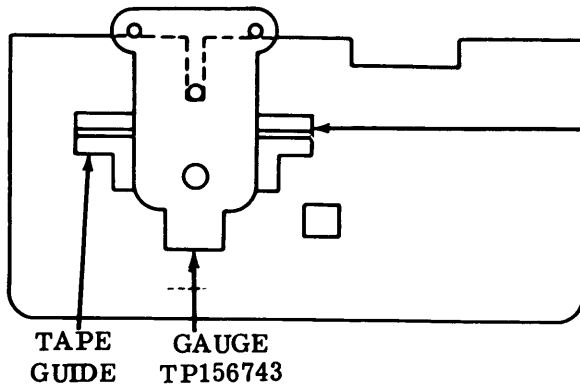
Requirement
 Min 14 oz --- Max 22 oz
 to start detent bail moving away from start-stop lever detent.

TAPE LID RELEASE PLUNGER SPRING

To Check
 Hold tape guideplate so top surface is horizontal. Open tape lid.

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

2.14 Tape Guideplate (LCXD)



TAPE GUIDE

Requirement
 With gauge properly positioned
 Min some---Max 0.003 inch
 between gauge and tape guides.

To Adjust
 Loosen tape guide mounting nuts to friction
 tight. Properly position gauge on tape
 guideplate. Position tape guides to meet
 requirement.

TAPE GUIDEPLATE

(1) Requirement

Shoulder of feed wheel post should not interfere with top plate or tape guideplate mounting brackets.

To Adjust
 Rotate feed wheel post with its mounting nut loosened.

(2) Requirement

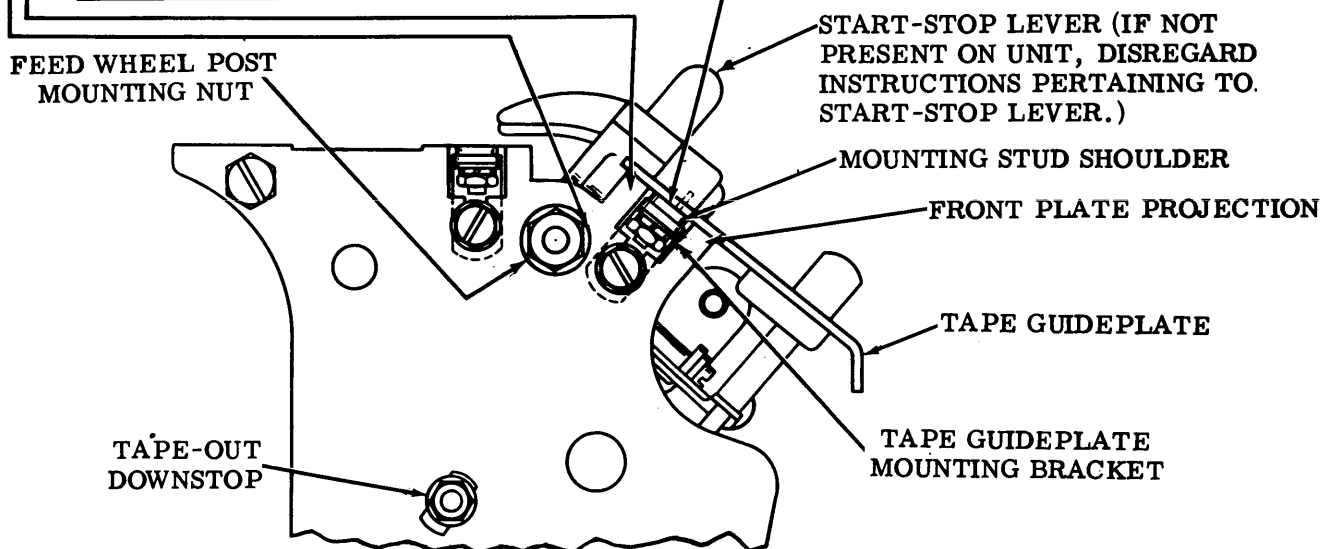
Tape guideplate should rest firmly against at least three projections of the front and rear plate.

To Adjust
 With tape-out downstop in its lowermost position and tape guideplate mounting bracket (front and rear) nuts friction tight, trip clutch and rotate shaft until sensing pins are in their uppermost position. With tape lid raised and start-stop lever in RUN position, press tape guideplate into position. Guide mounting screws into notch of front and rear plate, and place sensing pins adjacent to left edge of guideplate. Place tape-out pin into its hole. Tighten each bracket mounting screw.

(3) Requirement

Outer edges of mounting brackets and outer edges of mounting stud shoulders should align and project equally on front and rear brackets.

To Adjust
 Move tape guideplate toward front or rear. Tighten nuts only after top plate is adjusted.



2.15 Tape Feed Mechanism (LCXD)

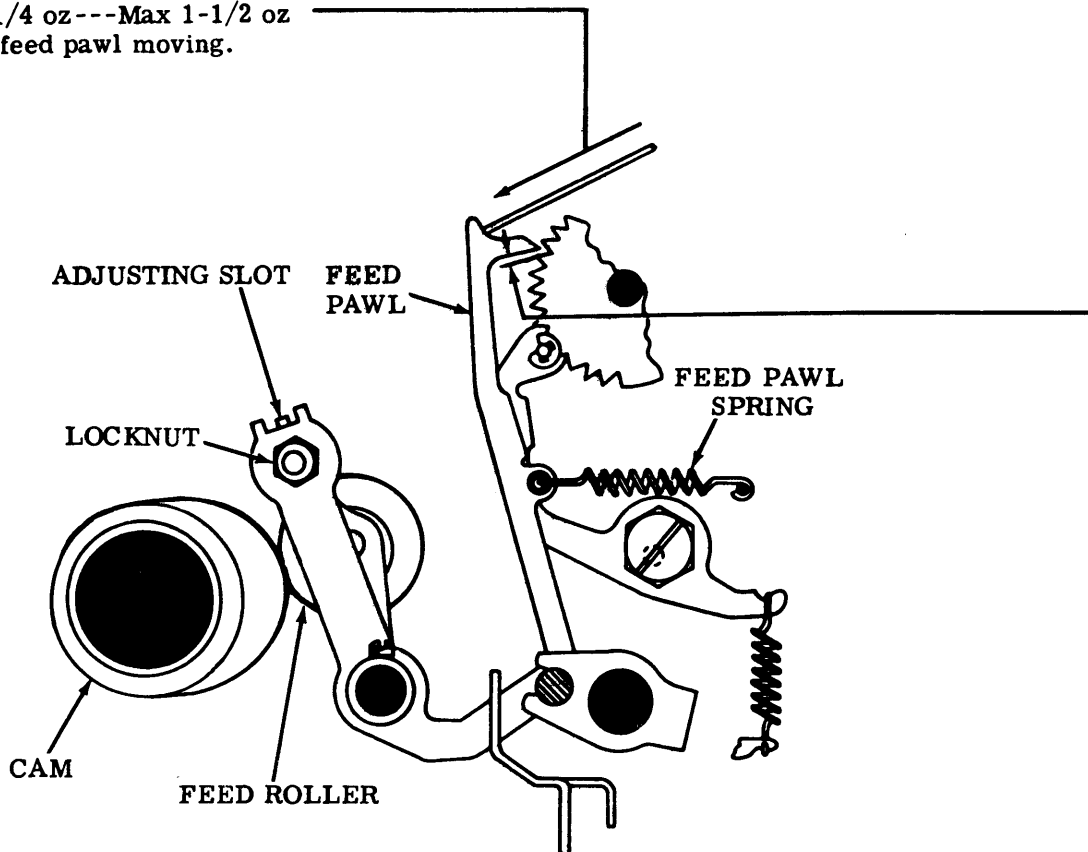
(B) FEED PAWL SPRING

To Check

Remove top plate, disengage clutch.

Requirement

Min 1/4 oz---Max 1-1/2 oz
to start feed pawl moving.



(A) FEED PAWL

Note: If unit is equipped with start-stop lever, place it in RUN position.

To Check

Remove top plate. Trip clutch and rotate camshaft until feed roller is on high part of cam. Rotate ratchet wheel until oil hole is up. Take up play by pressing down lightly on right end of feed pawl bail.

Requirement

Min some---Max 0.003 inch
clearance between feed pawl and ratchet tooth.

To Adjust

Position feed lever by means of the adjusting slot with its locknut loosened.

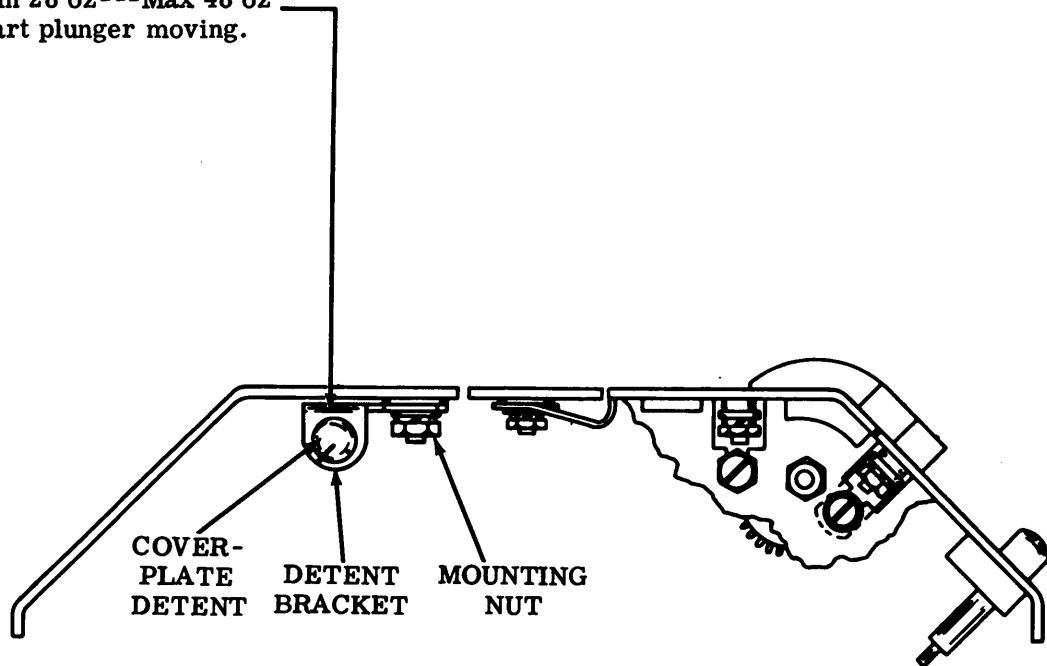
2.16 Coverplate Mechanism (LCXD)

COVERPLATE DETENT SPRING**To Check**

Remove coverplate.

Requirement

Min 28 oz---Max 48 oz
to start plunger moving.

COVERPLATE**(1) Requirement**

Coverplate held flush against top plate by detent action.

(2) Requirement

Coverplate rests on at least three side frame projections.

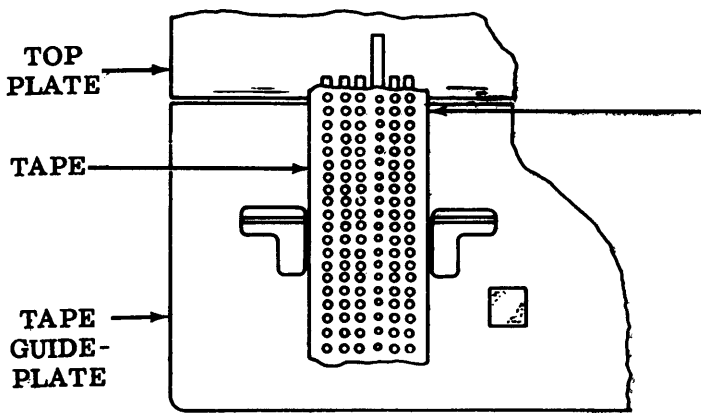
(3) Requirement

Front edge of cover and top plates in line.

To Adjust

Loosen detent nuts on side frames and move them to extreme lower right position. Tighten nuts. Loosen four bracket mounting nuts on coverplate and position to meet requirements. Tighten nuts. If coverplate does not detent properly (Requirement (1)), reposition detent nuts.

2.17 Tape Feed Mechanism (LCXD) (continued)



(A) FEED WHEEL DETENT

Note 1: If unit is equipped with a start-stop lever, place it in STOP position.

To Check

Place a LTRS perforated tape over feed wheel, taking up play in feed holes toward the right.

Requirement

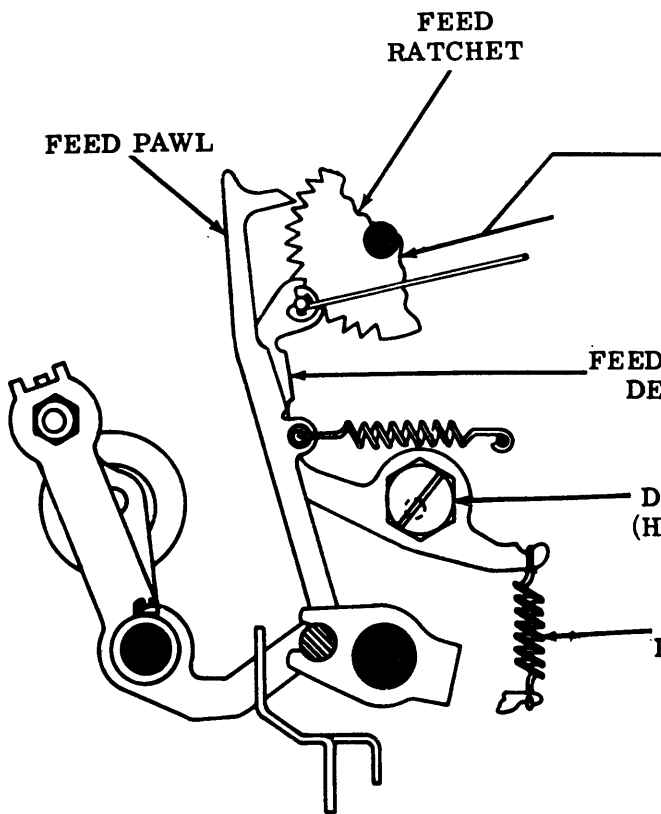
Sensing pins should be centrally located in code holes.

To Adjust

Position feed wheel detent eccentric with its lock screw and guidepost friction tight. High part of eccentric should be toward right. Hold eccentric and tighten guidepost and lock screw. Recheck adjustment.

Note 2: Feed pawl should be held away to facilitate adjustment.

(B) FEED RATCHET DETENT SPRING



Requirement

With feed pawl held away from ratchet wheel

Min 7 oz --- Max 13 oz to move detent roller away from fully detented position.

2.18 Top Plate Assembly (LCXD)

TOP PLATE (FIXED HEAD)

(1) Requirement

Top plate flush to 0.003 inch under flush with tape guideplate within width of tape lid.

To Adjust

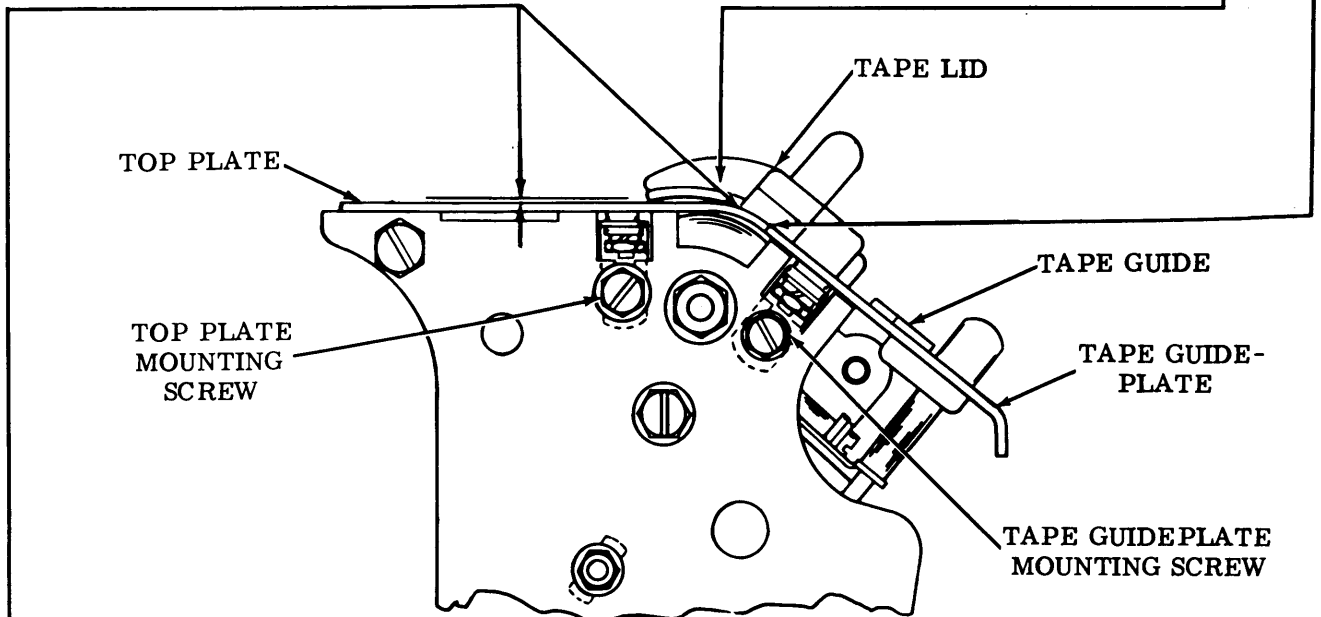
Loosen mounting bracket nuts until brackets are friction tight. Press top plate into position. Top plate should rest on at least three projections of side plates. Make sure the tight-tape arm extension is under the top plate.

(2) Requirement

Feed wheel slot and tape guideplate slot should line up.

To Adjust

Move top plate to line up feed wheel slot. Do not disturb Requirement (2) of TAPE GUIDEPLATE (2.14) adjustment.



(3) Requirement

With tape lid latched, clearance between tape lid extension covering feed wheel slot, and top plate

Min 0.010 inch
measured at curved portion of top plate, and
Min 0.010 inch---Max 0.025 inch
measured at flat portion of top plate.

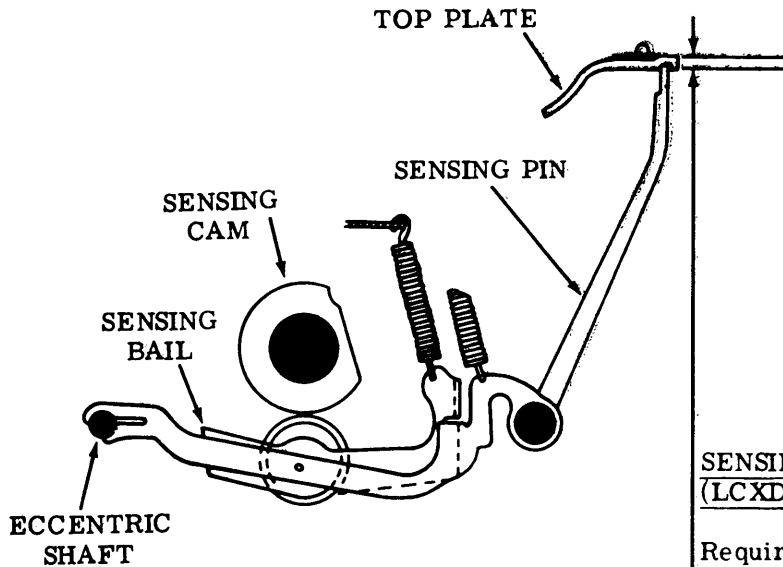
Also

Min 0.010 inch---Max 0.018 inch
clearance between tape lid and tape guideplate measured in area between tape guides (play in tape lid taken up toward tape guideplate).

To Adjust

Loosen two screws holding tape lid mounting brackets together, and position tape lid. Recheck Requirements (1) and (2) of TAPE LID (2.12) adjustment.

2.19 Sensing Mechanism (continued)



SENSING PINS (PIVOTED AND FIXED HEADS)
(LCXD)

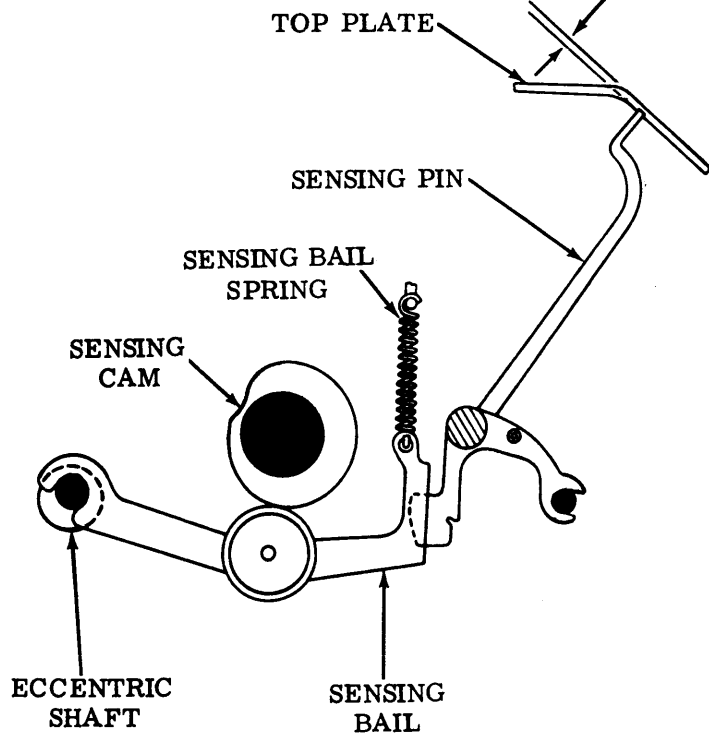
Requirement

In stop position, highest sensing pin should be flush to 0.005 inch below surface of top plate.

To Adjust

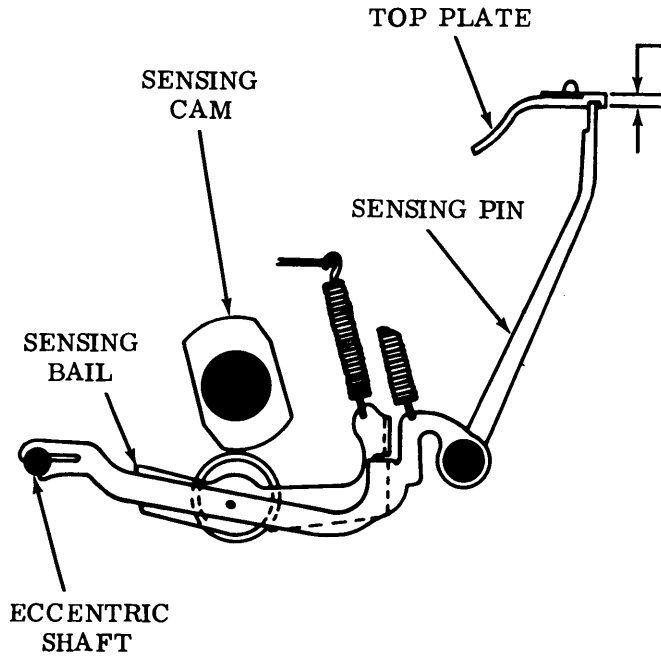
With clutch latched and yoke in locked position, loosen nut on eccentric shaft and adjust eccentric shaft with high part of eccentric toward right of unit. Tighten nut, rotate shaft, and recheck. Check throughout sensing head travel.

Note: High part of eccentric is marked on front end of shaft by a small indentation.



2.20 Sensing Mechanism (continued)

(A) SENSING PINS (LAXD)



Requirement

In stop position, highest sensing pin should be flush to 0.005 inch below surface of top plate.

To Adjust

With clutch latched and yoke in locked position, loosen nut on eccentric shaft and adjust eccentric shaft with high part of eccentric toward right of unit. Tighten nut, rotate shaft, and recheck. Check throughout sensing head travel. For 2-cycle operation, check both halves of cam sleeve.

Note: High part of eccentric is marked on front end of shaft by a small indentation.

(C) AUXILIARY LEVER SPRING

To Check

Each auxiliary lever on low part of its cam. Scale applied to lever just to right of spring. Pushlever held away.

Requirement

Min 1/2 oz --- Max 3 oz to start auxiliary lever moving.

(B) PUSHLER

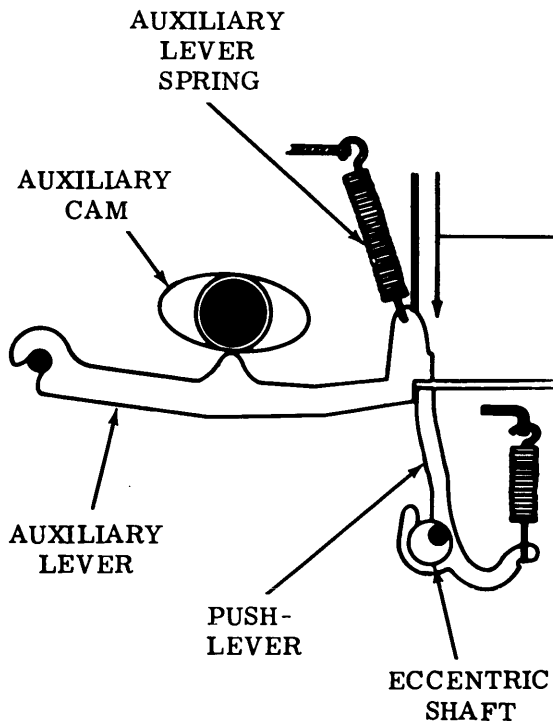
Requirement

With first one and then the other of the two auxiliary levers on the low part of the cam, the auxiliary lever with the least clearance should clear the tip of its pushlever by

Min 0.020 inch --- Max 0.045 inch

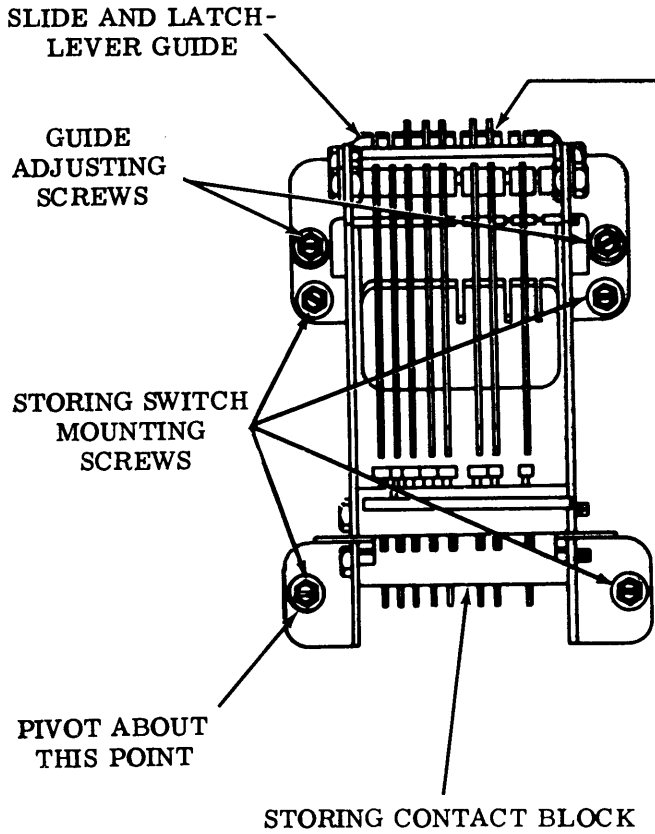
To Adjust

With clutch in the stop position and with pushlever eccentric shaft locknut (front plate) loosened and high part of eccentric located toward the upper right, rotate eccentric toward right or left. Recheck by rotating cam sleeve.



2.21 Storing Switch Mechanism and Oil Reservoir

(A) STORING SWITCH ASSEMBLY REPLACEMENT



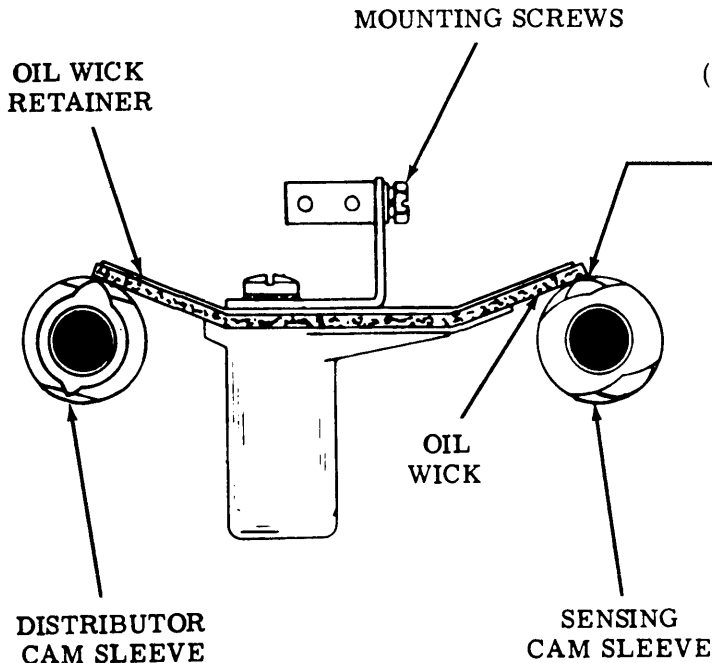
Requirement

Storing switch assembly should align with latchlevers so that latchlevers and slides function without binding.

To Check

Manually push latch bail follower away from cam until latches are free from guide. Release latch bail follower and note if latches fall into their respective slots.

(B) OIL RESERVOIR



Requirement

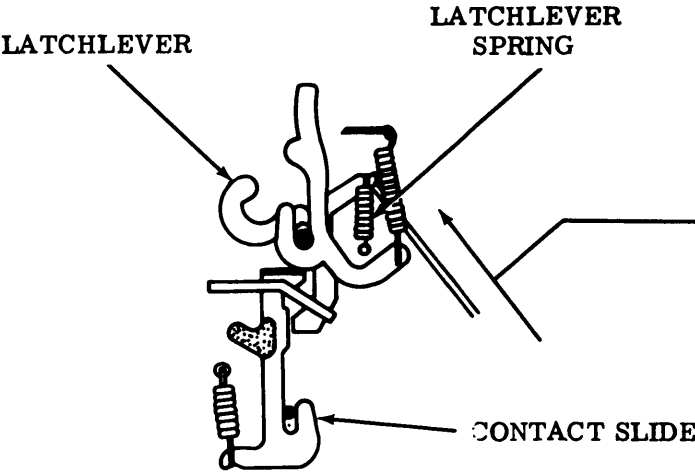
Each oil wick rests lightly on high parts of front and rear cam of each cam sleeve.

To Adjust

Trip both armatures and rotate shaft until high part of front and rear cam of each sleeve is under its wick. Position oil reservoir assembly with its mounting screws (2) loosened. When cam sleeve is rotated, teeth of wick retainer should not deflect upward more than 1/32 inch (gauge by eye). Refine adjustment by slightly bending teeth on wick comb spring.

2.22 Sensing Mechanism (continued)

(B) LATCHLEVER SPRING

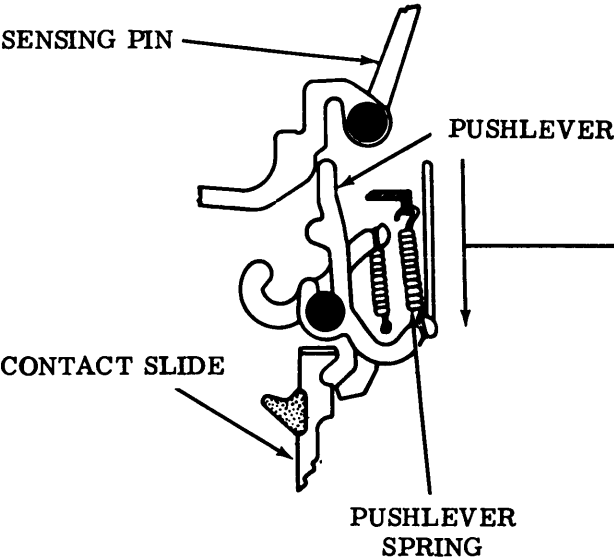


To Check
 Select blank combination. Trip sensing clutch and rotate shaft to stop position. Apply scale at right angle to top of latchlever.

Requirement
 Min 1 oz ---Max 3 oz
 to start latchlever moving.

Note 1: Take care not to damage push-lever springs in checking requirement.

(A) PUSHLEVER SPRING



To Check
 Trip clutch and rotate shaft until sensing pins are in uppermost position. Apply scale at right angle to extreme lower end of pushlever (sensing push-levers only).

Requirement
 Min 1 oz ---Max 2 oz
 to start pushlever moving.

Note 2: Be sure contact slides do not interfere with movement of pushlevers.

2.23 Sensing Mechanism (continued)

(C) TAPE-OUT (6TH) PIN SPRING

To Check

Sensing head in locked position, and tape-out pin in uppermost position. Apply scale in line with pin.

Requirement

Min 2-1/2 oz ---Max 5 oz for one-cycle clutch.

Min 1 oz ---Max 2 oz for 2-cycle clutch (LAXD unit) to move sensing pin flush with top plate.

Note: When checking the spring, allow the pushlever to remain under the transfer lever.

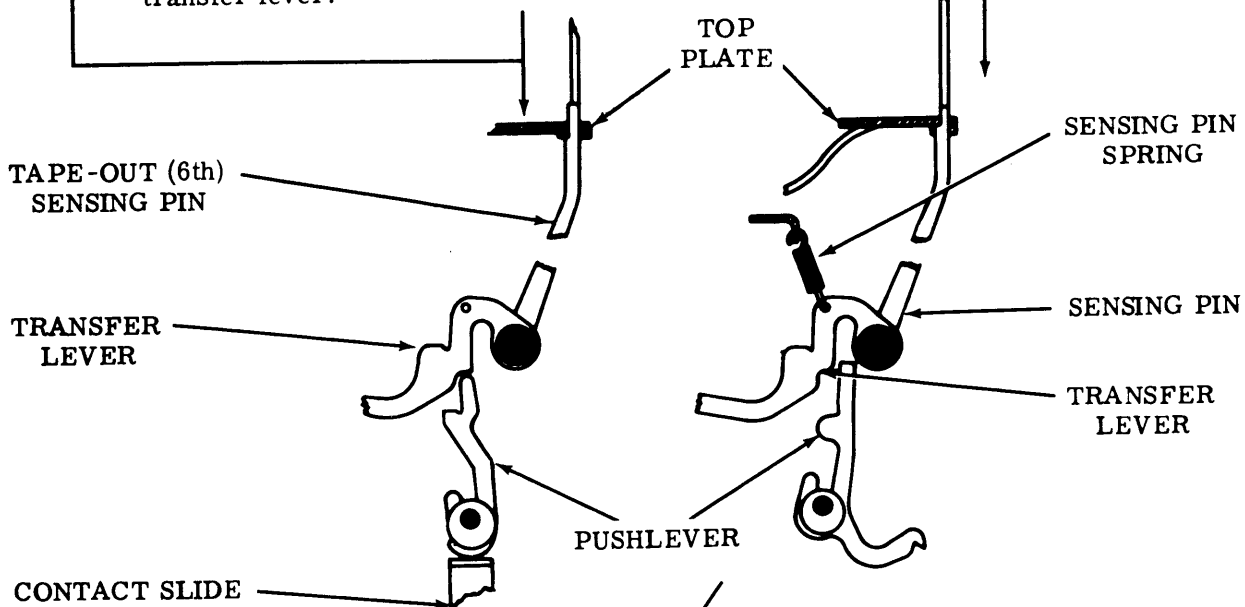
(B) SENSING PIN SPRINGS (PIVOTED HEAD)

To Check

With sensing head in locked position, trip sensing clutch and rotate sensing shaft until sensing pins are in uppermost position. While holding pushlevers away from transfer lever, apply scale in line with pin.

Requirement

Min 3 oz ---Max 4 oz to move sensing pins flush with top plate.



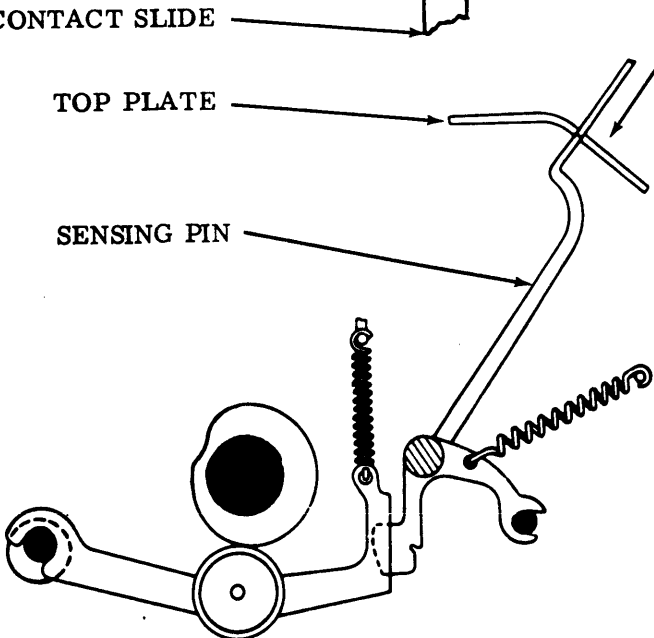
(A) SENSING PIN SPRINGS (FIXED HEAD) (LCXD)

To Check

With unit in upright position, trip sensing clutch and rotate sensing shaft until sensing pins are in uppermost position. While holding pushlevers away from transfer lever, apply scale in line with pin.

Requirement

Min 2 oz ---Max 3 oz to move sensing pins flush with top plate.



2.24 Sensing and Storing Switch Mechanism

(A) CONTACT LEVER SLIDE

Requirement

Clearance between closest pushlever and contact lever slide when sensing pins are in uppermost position, pushlevers are selected, and latchlevers are stripped

Min 0.005 inch---Max 0.015 inch

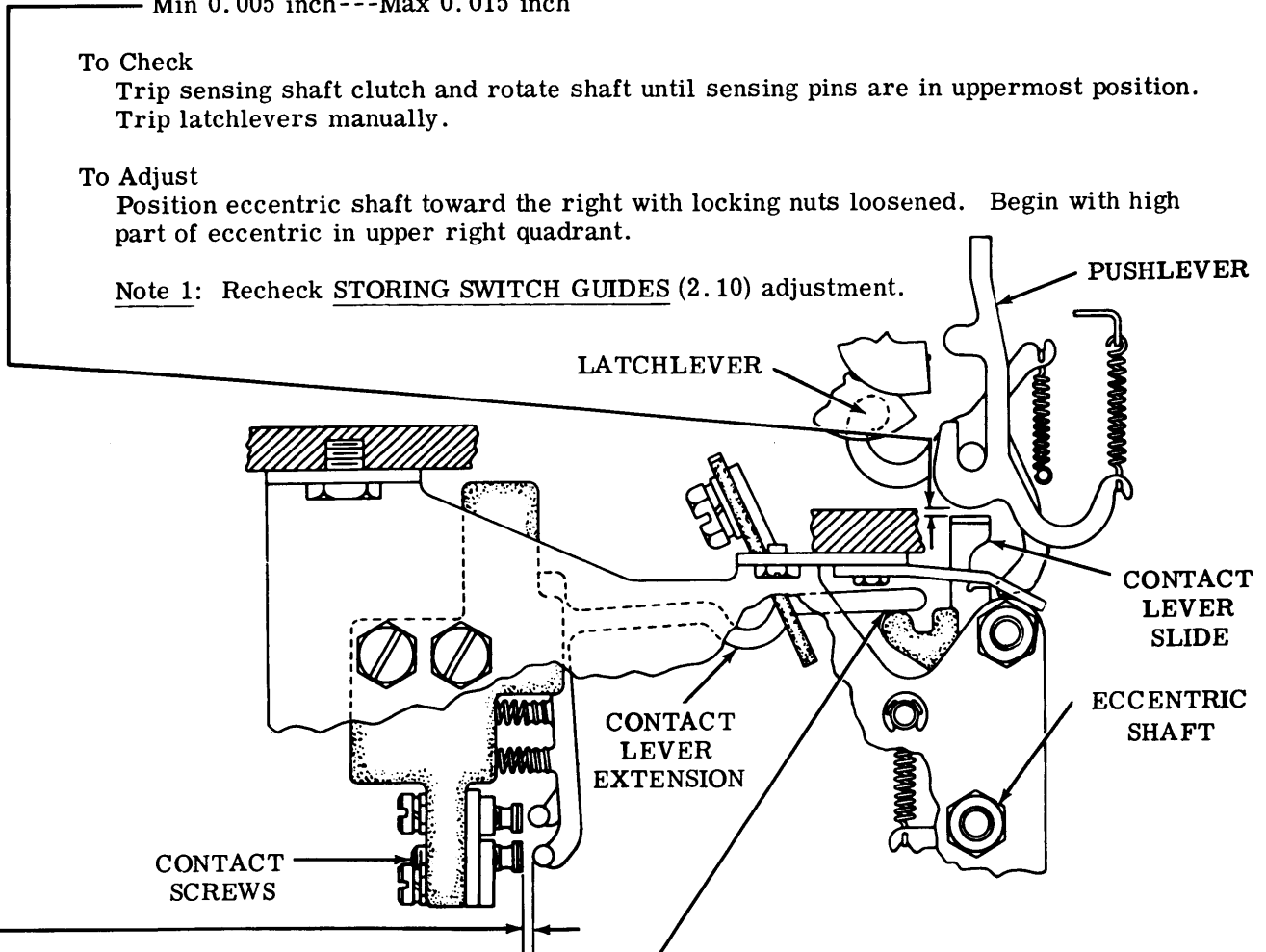
To Check

Trip sensing shaft clutch and rotate shaft until sensing pins are in uppermost position. Trip latchlevers manually.

To Adjust

Position eccentric shaft toward the right with locking nuts loosened. Begin with high part of eccentric in upper right quadrant.

Note 1: Recheck STORING SWITCH GUIDES (2.10) adjustment.



(B) STORING SWITCH CONTACT

(1) Requirement

Blank combination selected, clutch tripped, and shaft rotated one revolution to stop position.

Min 0.015 inch---Max 0.020 inch gap between each contact lever extension and its contact screw.

To Adjust

Rotate individual contact screw.

(2) Requirement

Min 0.010 inch

clearance between contact slide and contact lever extension (sensing pin contacts only).

To Check

Rotate shaft to strip pushlevers, but not latchlevers.

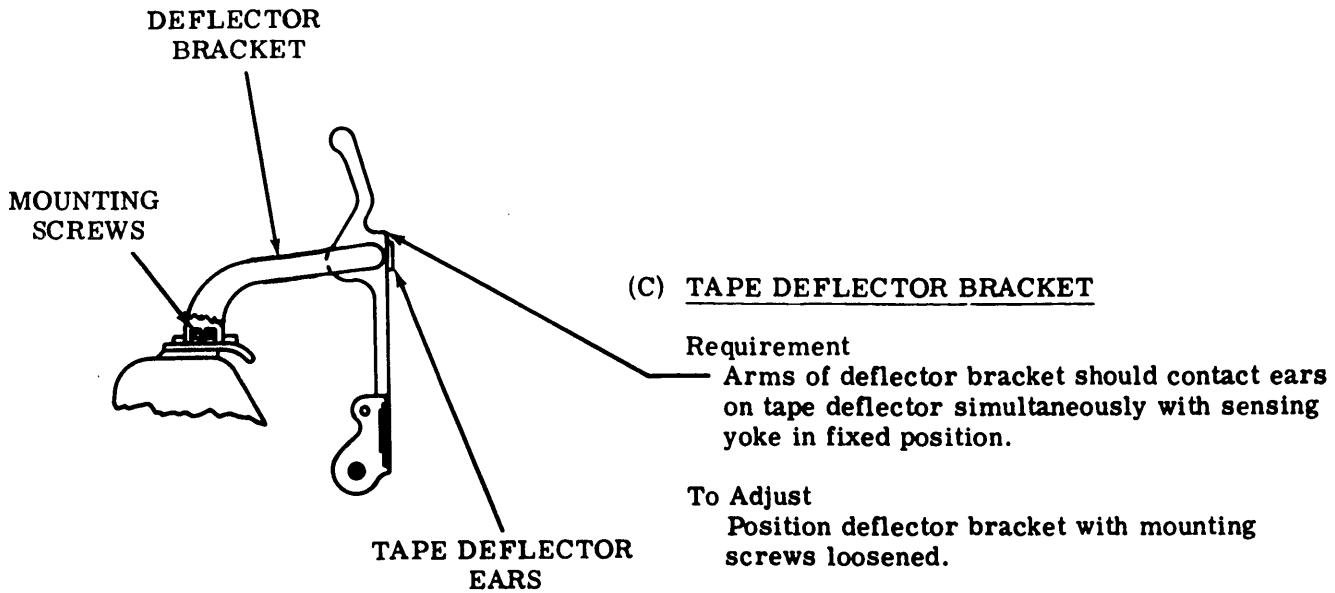
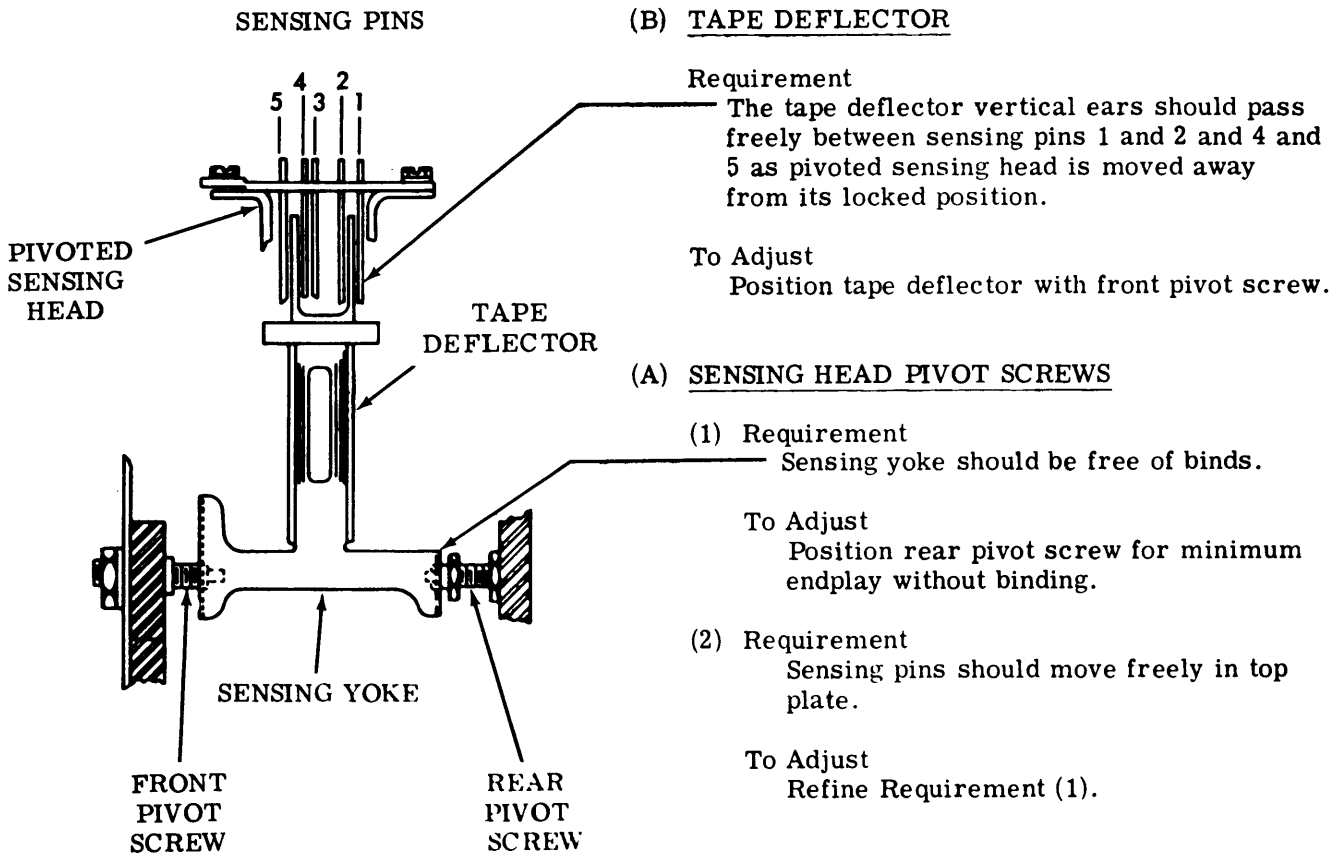
To Adjust

Refine Requirement (1).

Note 2: To gauge tape-out (6th) pin, rotate shaft until sensing pins are in uppermost position.

Note 3: The above requirements are final except in locations where a teletypewriter test set is available.

2.25 Pivoted Sensing Head



2.26 Pivoted Sensing Head (continued)

(A) FEED PAWL (PRELIMINARY)

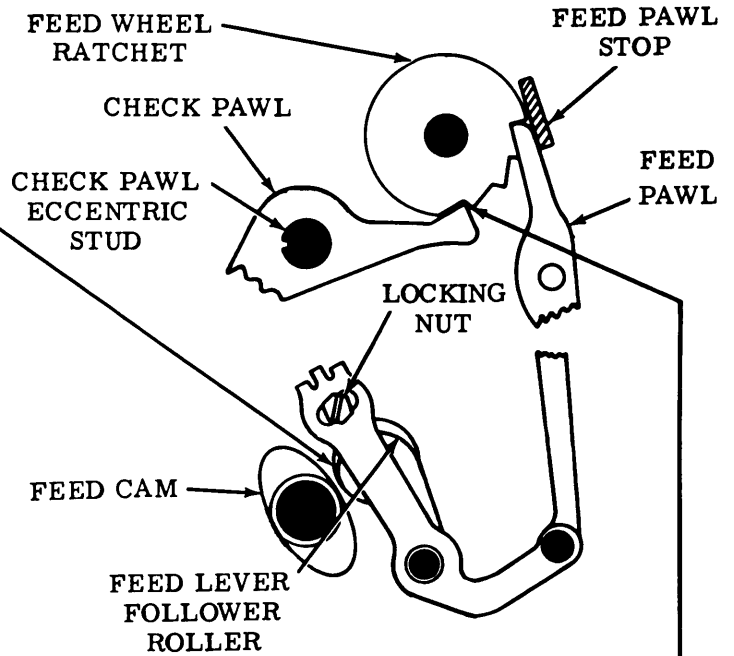
Requirement

Feed lever follower roller should be off cam when feed pawl rests against its upward stop.

To Adjust

Trip clutch and rotate shaft until feed pawl is in its upper position and bottomed on its stop. Position roller with locknut loosened.

Note 1: For 2-cycle operation (LAXD) check both sides of feed cam.



(B) CHECK PAWL

(1) **Requirement**

Check pawl should engage both teeth on ratchet with feed pawl in its up position.

To Adjust

Rotate check pawl eccentric stud.

Note 2: Groove on eccentric stud (high part of eccentric) must be on left side during adjustment.

(2) **Requirement**

Feed wheel should not move with sensing clutch in stop position (feed pawl down fully).

Note 3: Check requirement around entire periphery of ratchet.

To Adjust

Refine Requirement (1)

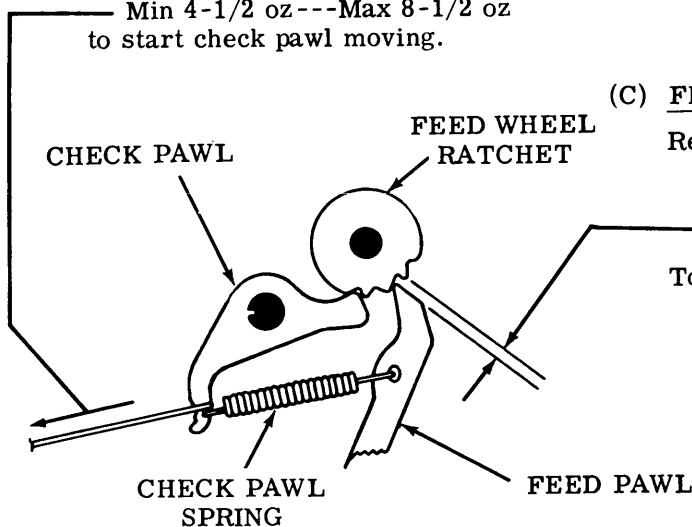
Note 4: Use slight pressure on feed wheel to prevent false indication due to overriding check pawl spring.

(D) CHECK PAWL SPRING

Requirement

Sensing clutch in stop position. Scale applied to check pawl.

Min 4-1/2 oz --- Max 8-1/2 oz to start check pawl moving.



(C) FEED PAWL (FINAL)

Requirement

Clearance between feed pawl and feed ratchet tooth with clutch in stop position
Min 0.030 inch --- Max 0.035 inch

To Adjust

Refine FEED PAWL (PRELIMINARY) adjustment (A).

Note 5: For 2-cycle operation (LAXD) adjust minimum side of feed cam only.

2.27 Pivoted Sensing Head (continued)

(B) TAPE RETAINING LID LATCH

(1) Requirement

Min 8 oz---Max 14 oz
to start tape retaining lid latch spring
moving away from top plate.

To Adjust

Bow lid latch spring with fingers. Do
not remove spring from yoke.

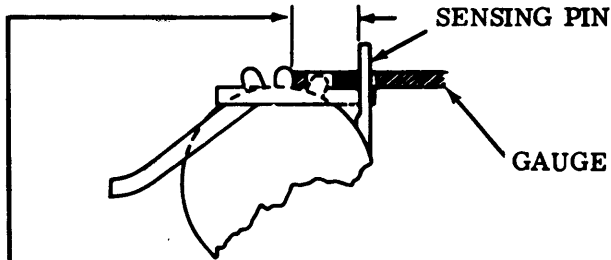
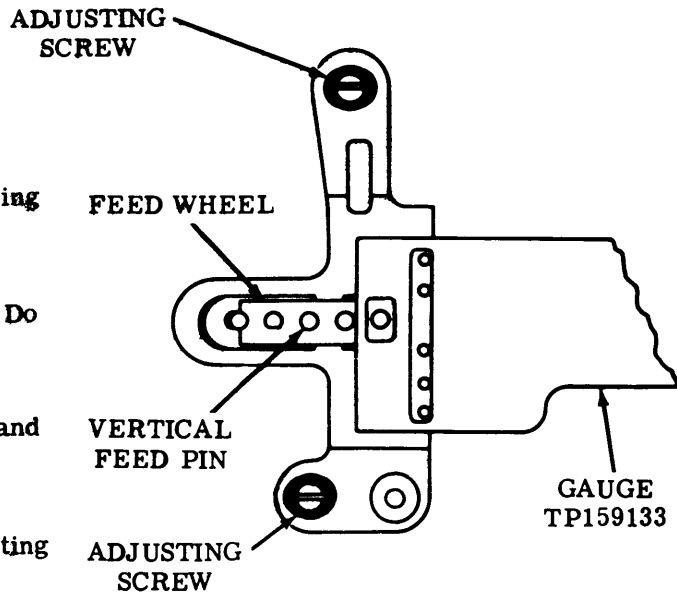
(2) Requirement

No play between tape retaining lid and
top plate when latched.

To Adjust

Position lid latch spring with adjusting
screw loosened.

Note: Be sure lid latch spring aligns
with lid on tape retaining lid.



(A) TOP PLATE

(1) Requirement

Spacing between vertical feed wheel
pin and sensing pins -0.300 inch.

To Adjust

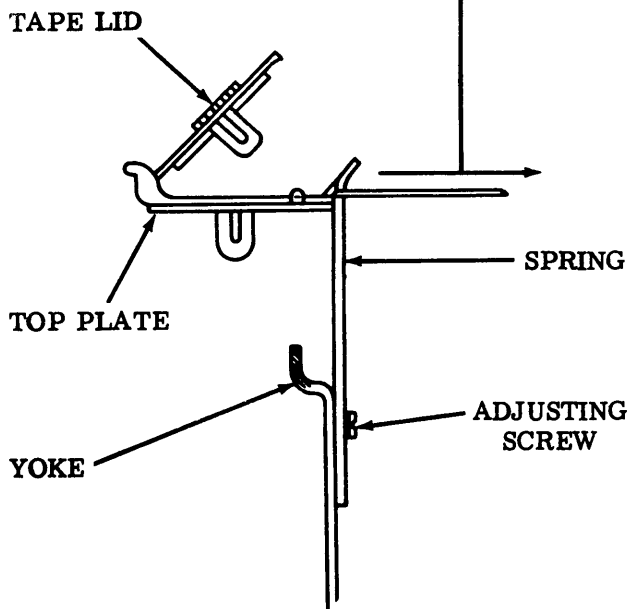
With pivoted sensing head against
its backstop, trip clutch, and rotate
shaft until sensing pins are in up-
permost position. Loosen top plate
mounting screws. Place gauge
TP159133 on top plate. Position
top plate until front edge of gauge
touches vertical feed pin and all
five sensing pins touch rear edge
of gauge. Recheck requirement.

(2) Requirement

Tape retaining lid must center
over top plate (gauge visually).

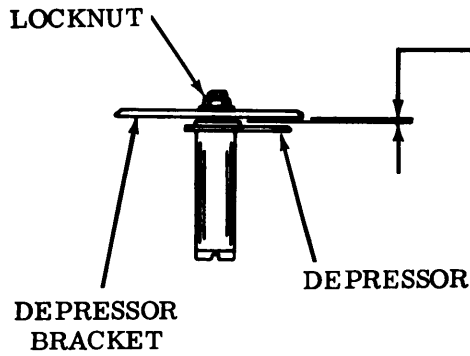
To Adjust

Refine Requirement (1).



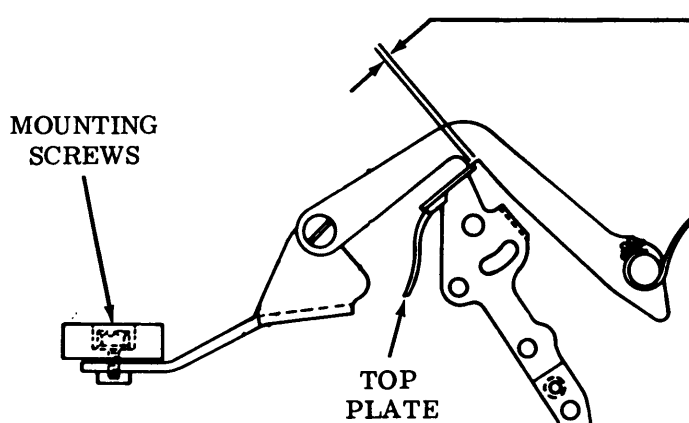
2.28 Tape Depressor

TAPE DEPRESSOR ALIGNMENT



- (1) Requirement
 Clearance between tape depressor and depressor bracket
 Min some---Max 0.002 inch

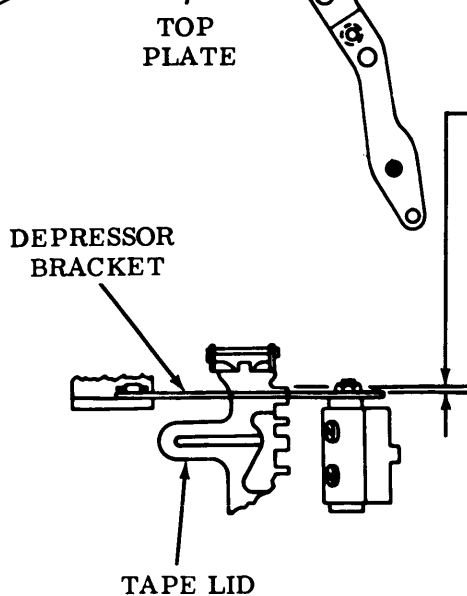
To Adjust
 Position adjusting screw and depressor with locknut loosened.



- (2) Requirement
 With tape depressor locked on top plate, and pivoted yoke against its stop, clearance between tape depressor and top plate
 Min 0.005 inch---Max 0.015 inch

To Adjust
 Position tape depressor with mounting screws loosened.

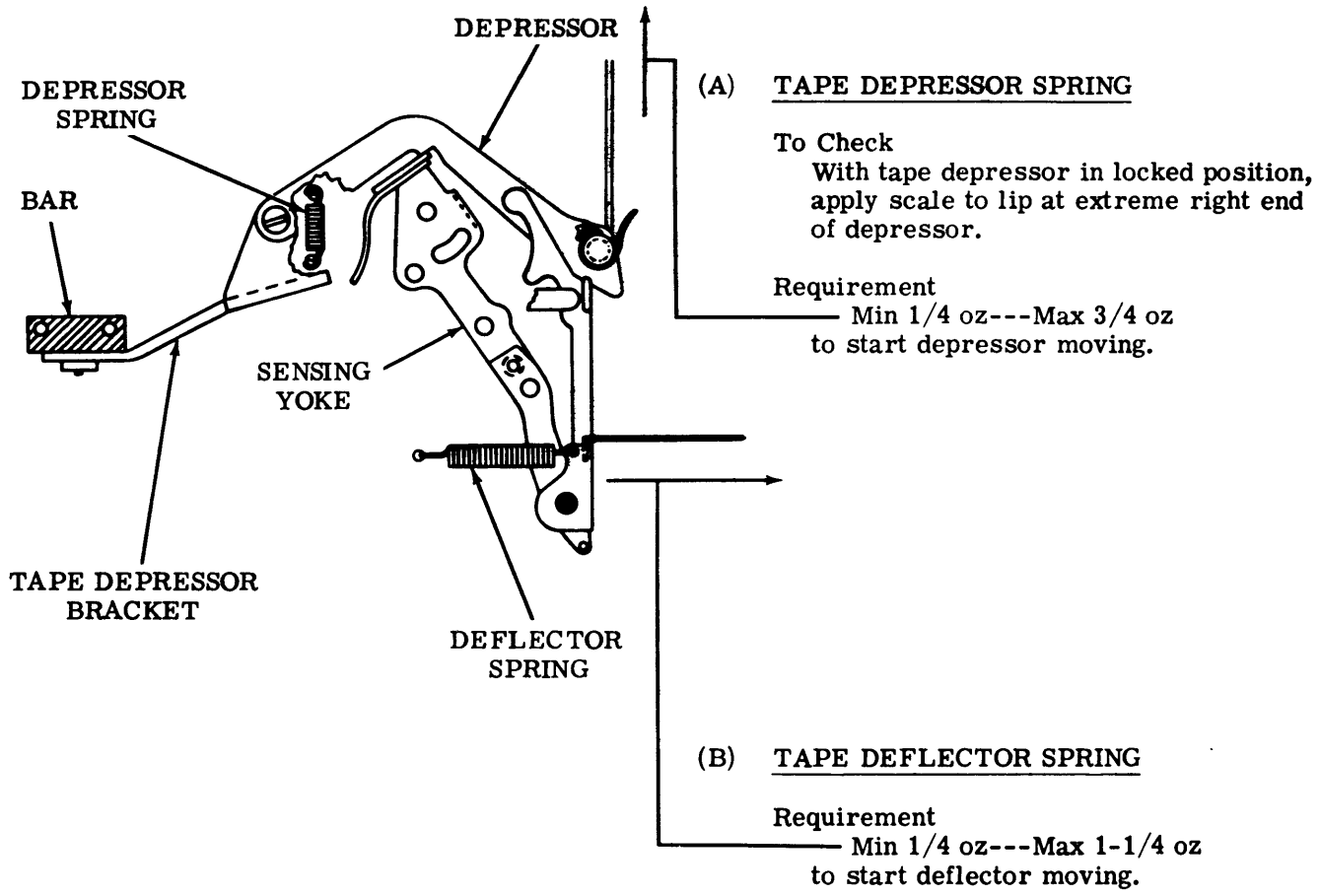
Note: When installed on reperforator transmitter base, 0.005 to 0.020 inch clearance is acceptable after pivoted head is properly aligned with punch block.



- (3) Requirement
 Clearance between depressor bracket and tape lid
 Min 0.010 inch---Max 0.050 inch

To Adjust
 Refine Requirement (2).

2.29 Tape Depressor and Last Character Contact Switch

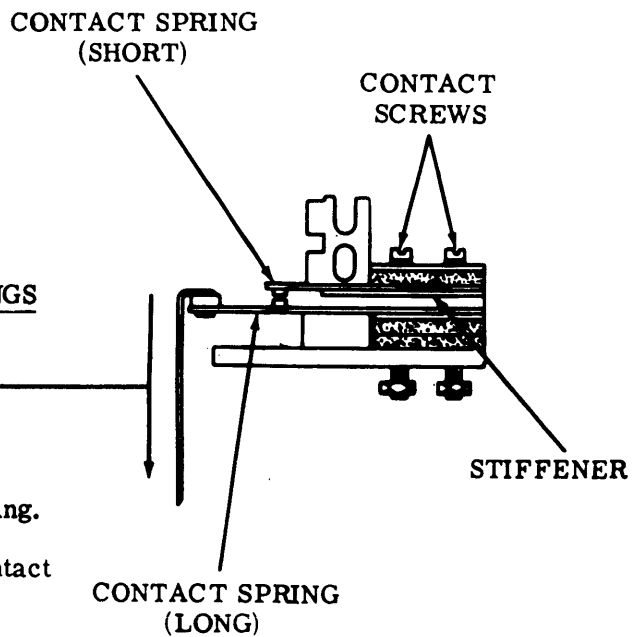


LAST CHARACTER SWITCH CONTACT SPRINGS

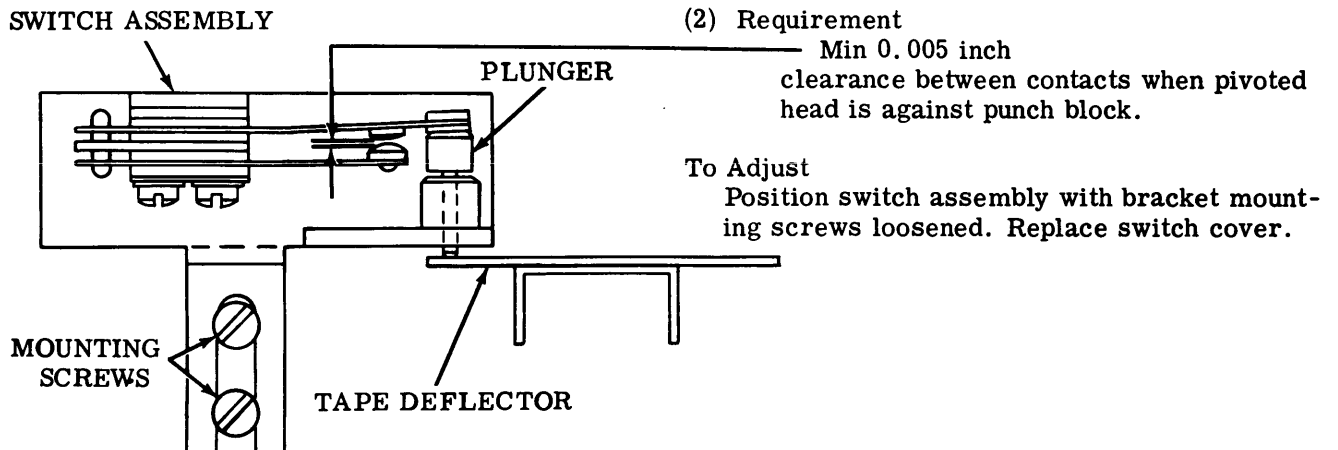
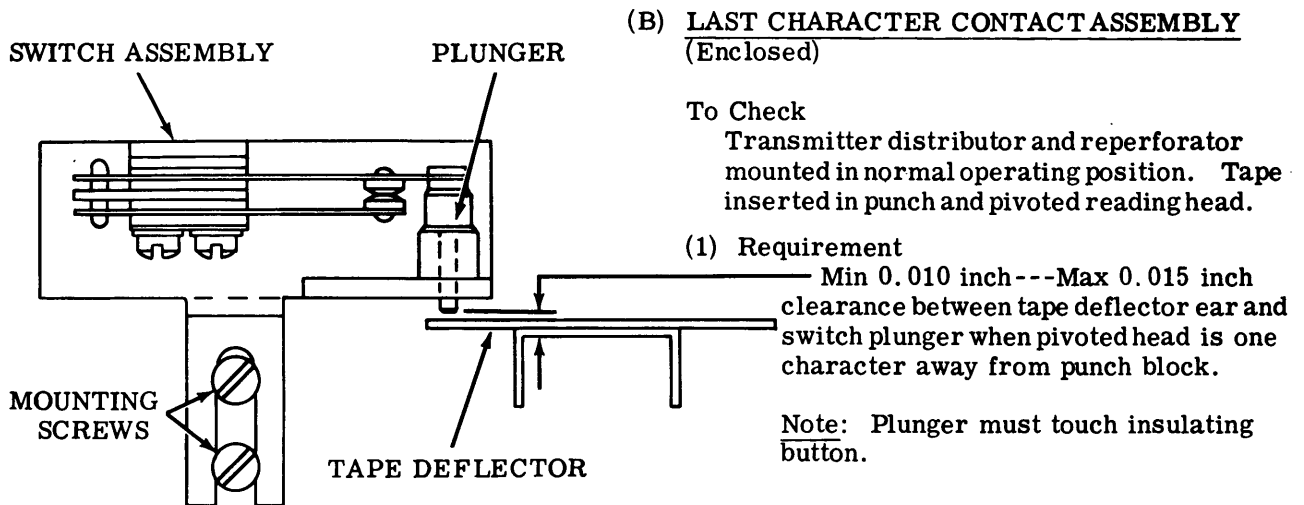
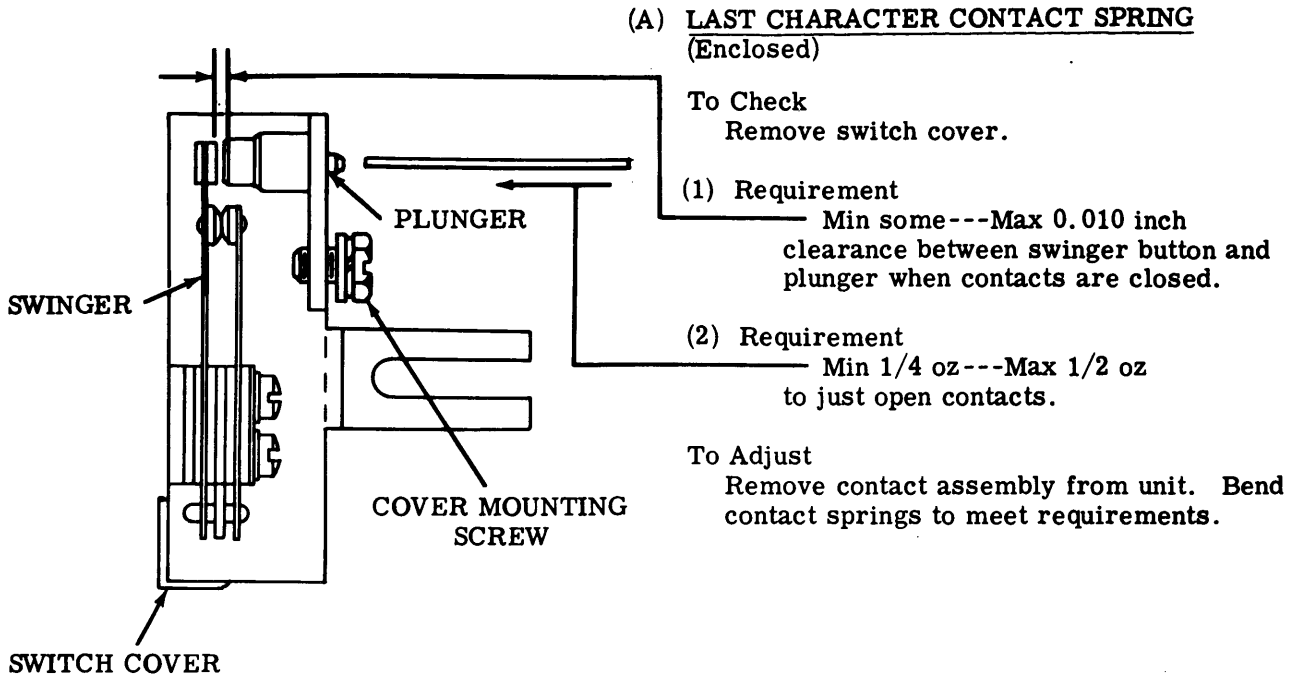
Requirement
Min 1/4 oz---Max 1/2 oz
to just open contacts.

To Adjust
With cover removed, bend long contact spring.

Note: For fully enclosed last character contact switch, see 2.30.



2.30 Fully Enclosed Last Character Contact Switch



2.31 Tape-Out and Tape Lid Switch (LCXD Without Start-Stop Lever)

TAPE-OUT AND TAPE LID SWITCH

Note: It may be necessary to remove the contact bracket assembly to make this adjustment.

(1) Requirement

Min 8 grams---Max 15 grams
to just separate normally closed contacts (apply scale to center of nylon pad).

To Adjust

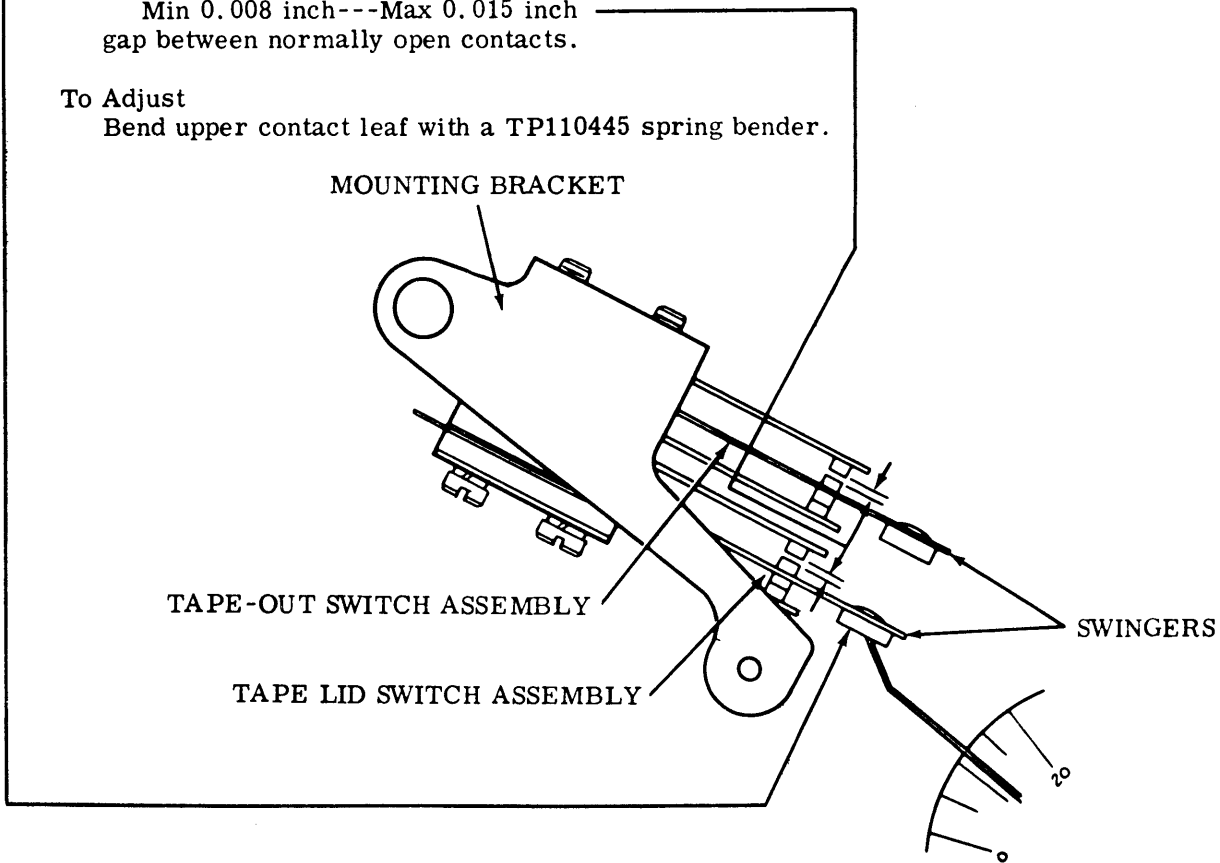
Bend contact swinger with a TP110445 spring bender.

(2) Requirement

Min 0.008 inch---Max 0.015 inch
gap between normally open contacts.

To Adjust

Bend upper contact leaf with a TP110445 spring bender.



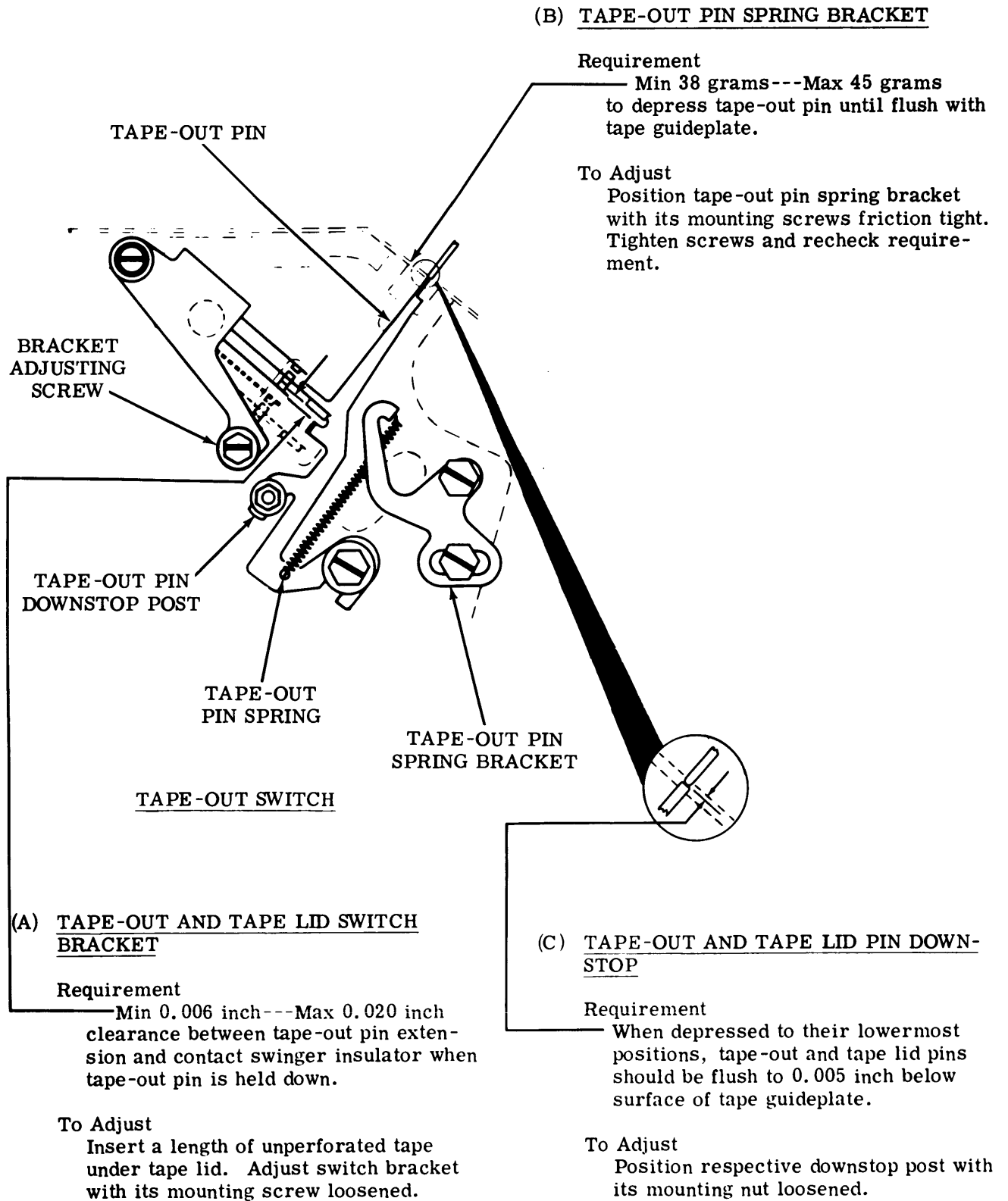
INSTRUCTIONS FOR REMOVING TAPE-OUT AND TAPE LID SWITCH ASSEMBLY

- (1) Remove cover and top plates.
- (2) Remove spring attached to bracket on guidepost.
- (3) Loosen screw securing guidepost to rear plate.
- (4) Remove screw and lockwasher from front end of guidepost.
- (5) Remove adjusting screw from lower end of switch bracket.
- (6) Guidepost and switch assembly can now be removed. Take care not to distort switch leaf springs.

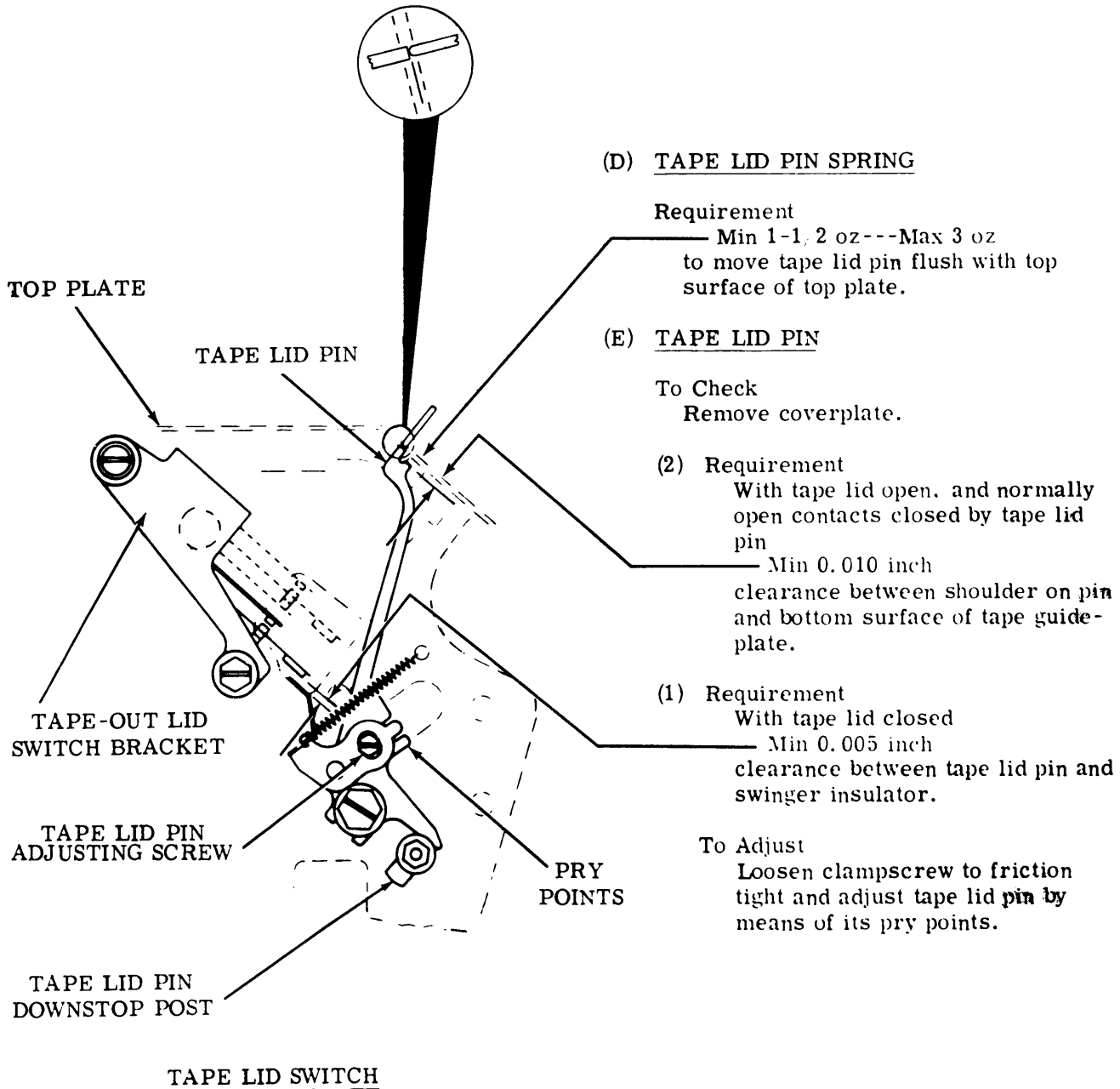
TO REPLACE SWITCH ASSEMBLY

Reverse disassembly procedure.

2.32 Tape-Out and Tape Lid Pin Mechanism (LCXD Without Start-Stop Lever)



2.33 Tape-Out and Tape Lid Pin Mechanism (LCXD Without Start-Stop Lever) (continued)



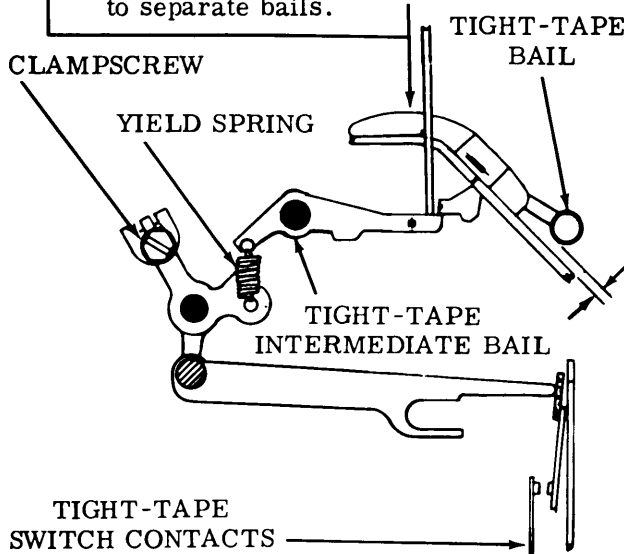
2.34 Tight-Tape Switch Assembly (LCXD)

Note 1: For all adjustments on this page, start-stop lever (if present) must be in RUN position.

(D) TIGHT-TAPE BAIL YIELD SPRING

To Check
Open tape lid. Hold switch actuator in position with fingers.

Requirement
Min 2 oz ---Max 3-1/2 oz
to separate bails.



ARM ASSEMBLY

MOUNTING SCREWS

(C) TIGHT-TAPE ARM

Requirement
Tight-tape switch contacts should open when tight-tape arm is raised
Min 0.045 inch ---Max 0.075 inch
above tape guideplate.

To Adjust
With clampscrew friction tight, position bails, by means of pry point, to meet requirement.

(A) TIGHT-TAPE SWITCH BRACKET

To Check
Loosen clampscrew, and move TIGHT-TAPE ARM adjustment to center of its range.

Requirement (Preliminary)
Min 0.006 inch ---Max 0.015 inch
clearance between switch actuator and insulator pad on swinger.

Requirement (Final)
After completion of TIGHT-TAPE ARM adjustment,
Min 0.006 inch
clearance between switch actuator and insulator pad.

To Adjust
With switch bracket mounting screws friction tight, position bracket. Tighten screws and recheck requirement.

(B) TIGHT-TAPE SWITCH

Note 2: It may be necessary to remove switch from unit to make this adjustment.

(1) Requirement
Min 0.050 inch ---Max 0.070 inch
clearance between switch backstop and insulator pad on swinger when switch contacts are closed.

To Adjust
Bend switch backstop with TP110445 spring bender.

(2) Requirement
Min 3 oz ---Max 4 oz
to just separate contacts.

To Adjust
Bend contact swinger with a TP110445 spring bender.

2.35 Tape-Out Switch Assembly (LCXD With Start-Stop Lever)

(A) TAPE-OUT SWITCH

To Check

Remove cover and top plate. Loosen tape-out spring adjusting bracket. Position bracket so tape-out extension is not touching swinger pad.

(1) Requirement

Min 8 grams---Max 15 grams
to just separate normally closed contacts (scale at center of swinger pad).

To Adjust

Disconnect tape-out extension bail. Remove switch assembly. Form contact swinger with a TP110445 spring bender.

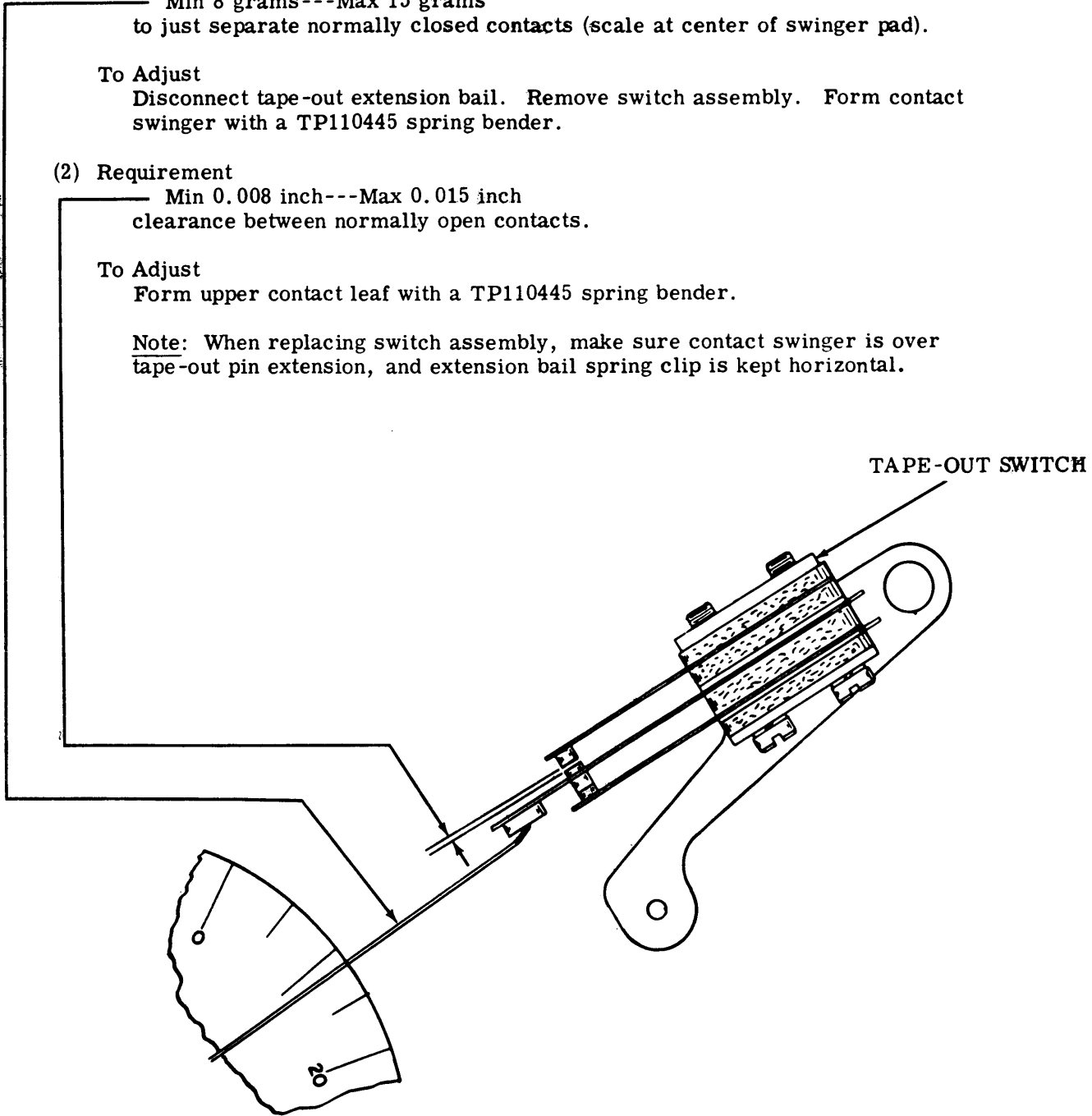
(2) Requirement

Min 0.008 inch---Max 0.015 inch
clearance between normally open contacts.

To Adjust

Form upper contact leaf with a TP110445 spring bender.

Note: When replacing switch assembly, make sure contact swinger is over tape-out pin extension, and extension bail spring clip is kept horizontal.



(Rear View)

2.36 Tape-Out Switch Assembly (LCXD With Start-Stop Lever) (continued)

(B) TAPE-OUT PIN

(1) Requirement

When start-stop lever is in FREE or STOP position, tape-out pin should be flush to 0.010 inch below surface of tape guideplate.

To Adjust

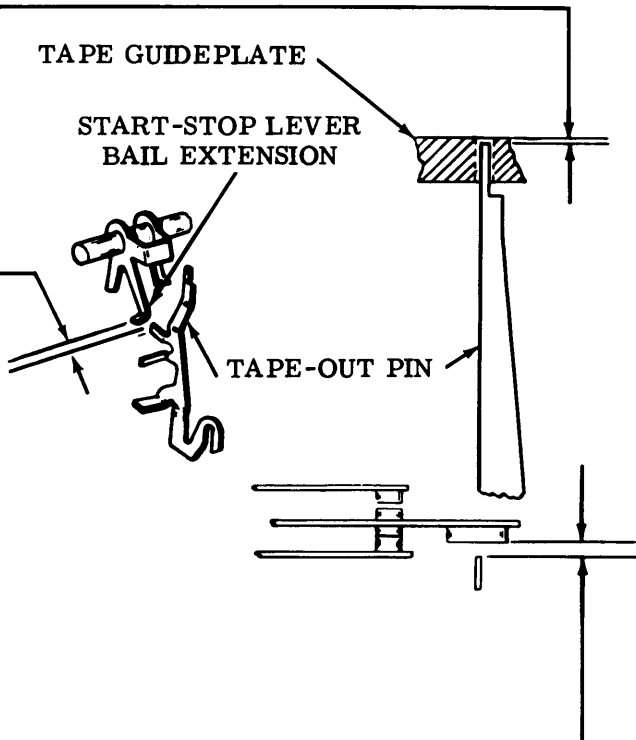
Position tape-out pin downstop with its mounting nut loosened.

(2) Requirement

With start-stop lever in RUN position
Min 0.055 inch clearance between tape-out pin extension and start-stop lever bail extension.

To Adjust

Position extension bail with its mounting screw loosened.



(C) TAPE-OUT SWITCH BRACKET

To Check

Insert piece of unperforated tape under tape lid.

Requirement

Min 0.006 inch---Max 0.020 inch clearance between tape-out pin extension and contact swinger pad.

To Adjust

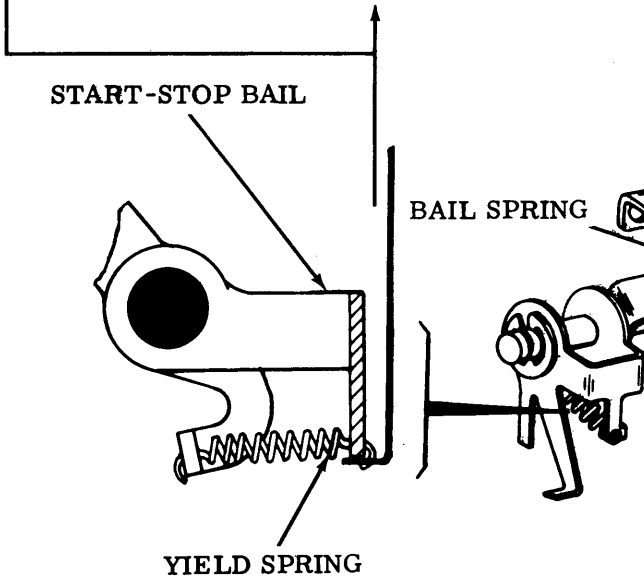
Position switch bracket with its mounting screw loosened.

2.37 Tape-Out Pin and Bail Assembly (LCXD with Start-Stop Lever)

(A) TAPE-OUT BAIL YIELD SPRING

To Check
Place start-stop lever in RUN position.

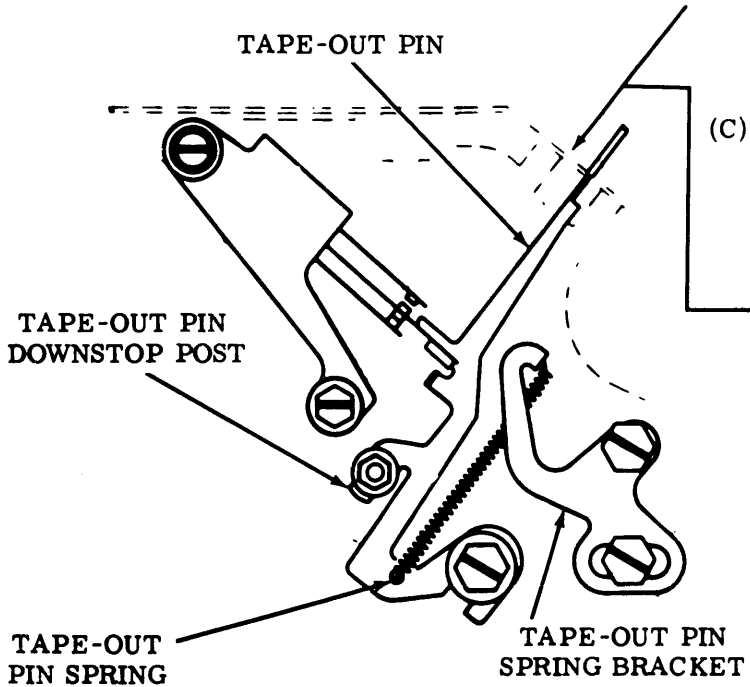
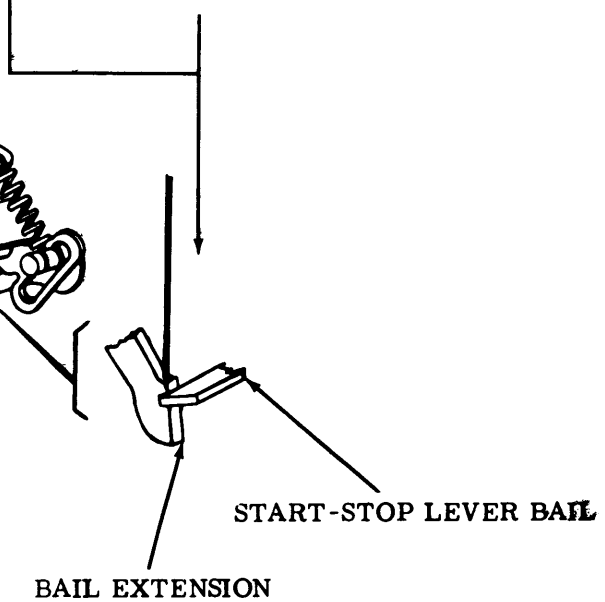
Requirement
Min 3 oz---Max 5 oz
to separate bails.



(B) TAPE-OUT EXTENSION BAIL SPRING

To Check
Place start-stop lever in RUN position.

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



(C) TAPE-OUT PIN SPRING

To Check
Place start-stop lever in RUN position.

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

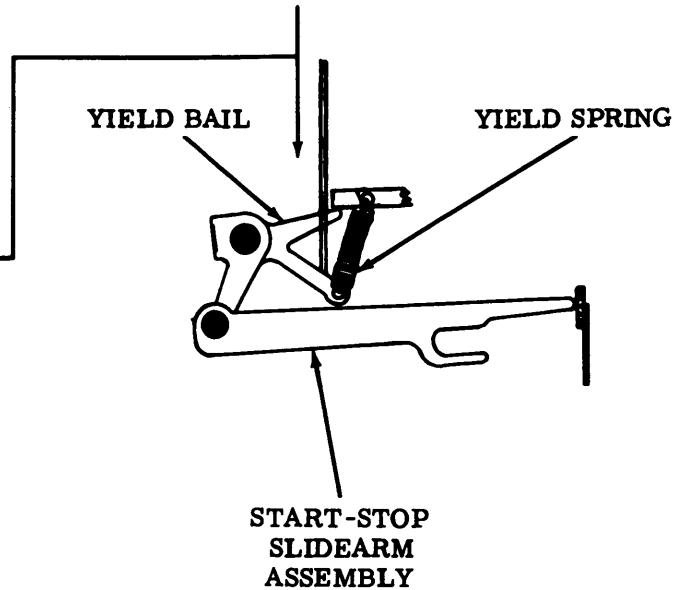
To Adjust
Position spring bracket with its
mounting screws loosened. Recheck
requirement.

2.38 Start-Stop Switch Assembly (LCXD)

START-STOP BAIL YIELD SPRING

To Check
Place start-stop lever in RUN position.

Requirement
Min 4 oz ---Max 6 oz
to separate bails.



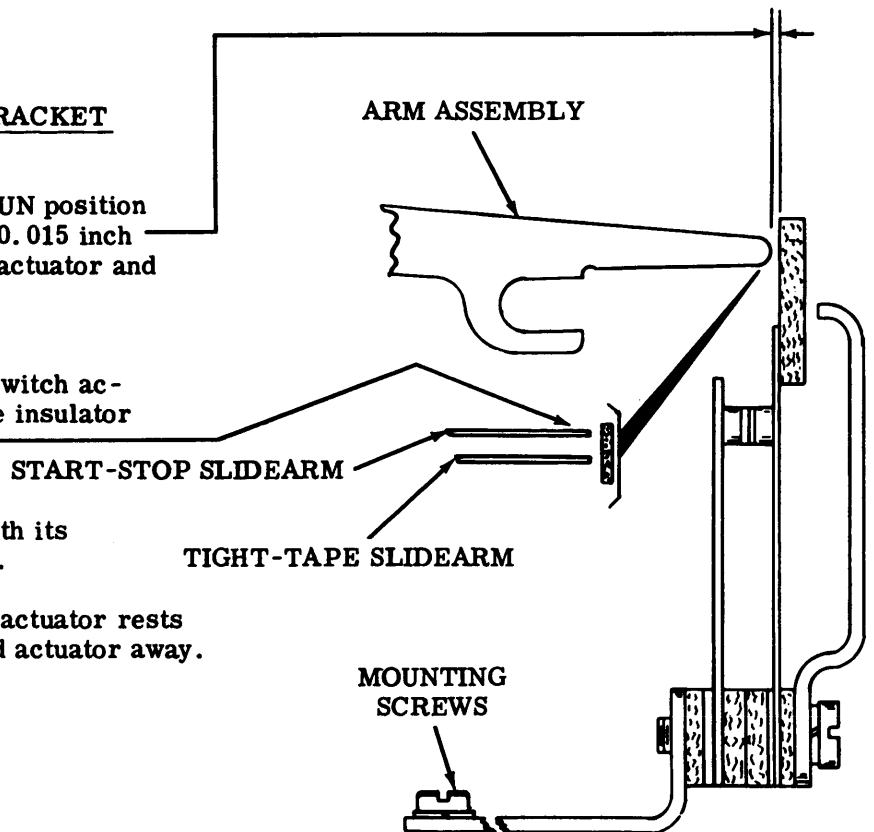
START-STOP LEVER SWITCH BRACKET

(1) Requirement
With start-stop lever in RUN position
Min 0.006 inch ---Max 0.015 inch
clearance between switch actuator and
insulator pad on swinger.

(2) Requirement
Start-stop and tight-tape switch ac-
tuators should fully engage insulator
pad on swinger.

To Adjust
Position switch bracket with its
mounting screws loosened.

Note: If tight-tape switch actuator rests
against insulator pad, hold actuator away.



3. TRANSMITTER DISTRIBUTOR CONTACT STROBING

GENERAL

3.01 The following adjustment procedure outlines pulse length requirements for transmitter distributor units operating at various speeds (opm) and transmission patterns (i e, 7.00, 7.42, or 7.50 unit code). In all cases, both the test set and the unit under test must be operating at the same speed for proper strobing. All pulse length requirements are made with respect to a 7.42 unit code test set scale, regardless of the cam arrangement of the transmitter distributor.

3.02 When discussing the operating speed of a unit, a number of different terms may be used to represent the same speed. A typical teletypewriter or data channel, for example, may be described in terms of modulation rate (baud), or rate of transmission of information (wpm or opm). In the following strobing procedure, reference is made to both opm and baud. In other parts of this section, reference is also made to wpm. These three terms, although defined differently, can be used interchangeably to represent the operating speed of any transmitter distributor unit.

3.03 The term opm is an abbreviation for operations per minute, and is defined as follows:

$$\text{Formula (1) opm} = \frac{c}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}}$$

That is, the speed of a unit, in operations per minute (opm), is equal to the transmission rate, in characters per second (c/sec), times 60 sec/min. Since a character is transmitted each operation, this term provides a measure of the amount of information which may be transmitted by the unit.

3.04 The term wpm is an abbreviation for words per minute, and is defined as follows:

$$\text{Formula (2) wpm} = \frac{\frac{c}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}}}{6 \frac{c}{\text{word}}}, \text{ or } \text{wpm} = \frac{c}{\text{sec}} \times 10$$

That is, the speed of a unit, in words per minute (wpm), is equal to the transmission rate, in characters per second (c/sec), times 60 sec/min, divided by 6 c/word. It may be noted, from observation of the defining formulas for opm and wpm, that a close relationship exists between these terms. The only difference in the defining formulas is that equation (2) has an extra term (6 c/word) which appears as a denominator.

3.05 From the above two equations, a third one may be derived. Since $\text{opm} = \frac{c}{\text{sec}} \times 60 \text{ sec/min}$, we can replace the numerator of equation (2) — which is $\frac{c}{\text{sec}} \times 60 \text{ sec/min}$ — by opm. The result will be:

$$\text{Formula (3) wpm} = \frac{\text{opm}}{6 \frac{c}{\text{word}}}, \text{ and } \text{opm} = (\text{wpm}) (6 \frac{c}{\text{word}})$$

3.06 Formula (3) is a valid one to use when converting from one term to the other as long as the exact values, and not approximate values, for wpm or opm are used. For example, one of the standard transmitter distributor operating speeds is generally stated as being 60 wpm. This value, however, is only an approximate one used to simplify discussion of the unit. In all cases, units transmitting 60 wpm are actually operating at 368 opm. By formula (3), it can readily be calculated that the unit is transmitting not 60 wpm, but 61.33 wpm:

$$\text{wpm} = \frac{\text{opm}}{6 \frac{c}{\text{word}}}; \text{ wpm} = \frac{368}{6} = \underline{\underline{61.33}}$$

3.07 The following information is provided to aid in determining the operating speed of a unit when either opm or wpm (actual or approximate) is known. It is not a complete listing of all available speeds, but is representative of the speeds most in use.

Operations Per Minute (opm)	Words Per Minute (wpm)	
	Actual	Approximate
368	61.33	60
390	65.00	65
428.6	71.43	70
460	76.66	75
600	100.00	100
636	106.00	106
642	107.15	107

3.08 The remaining term, baud, is defined as a unit of telegraphic speed — or modulation rate — which indicates the time duration of the shortest signal element of a transmitted character. The defining formula for baud is:

$$\text{Formula (4) baud} = \frac{\text{opm} \times \text{unit code}}{60 \text{ sec} / \text{min}}, \text{ or}$$

$$\text{Formula (5) baud} = \frac{c}{\text{sec}} \times \text{unit code}$$

This term differs from the first two defined in that, while opm and wpm provide an indication of the amount of information transmitted by a unit, the term baud is most correctly used when referring to the binary digital modulation rate of the information transmitted.

3.09 The objective of this discussion has been to introduce the technician to the above terms, so that their usage will be better understood by him. Finally, by use of the five defining formulas, the technician should be able to convert from one type of speed terminology to another, if the need should arise.

LAXD CONTACT STROBING PROCEDURE — 1-CYCLE CAM

Note: To strobe the distributor and sensing contacts, a Signal Distortion Test Set (DXD) or Stroboscopic Test Set (LSS) may be used. For operation of these sets, refer to Bulletin 181B or 261B, respectively.

3.10 Distributor Contacts — Stop and No. 1 Through No. 5 (368, 428, 460, 600, 636, and 642.9 OPM):

- (a) Connect a test set to the output of the distributor contacts. Test set and transmitter distributor must be operating at the same speed.

Note: Operate the 7.50 unit code transmitter distributor (LAXD6) only at 600 opm.

- (b) Insert a "blank" perforated tape into the transmitter distributor sensing head. Trip the distributor clutch. (On some units, the distributor clutch may be tripped electrically via operation of the sensing shaft.) Orient the test set scale so the 142 mark of its stop segment is aligned with the end of the stop pulse image.

Requirement (Figure 1)

Length of stop pulse to be (within + 4%): 106 scale divisions (7.00 unit code cam), 142 scale divisions (7.42 unit code cam), 148 scale divisions (7.50 unit code cam).

To Adjust

Rotate the distributor stop contact adjusting screw to meet requirement.

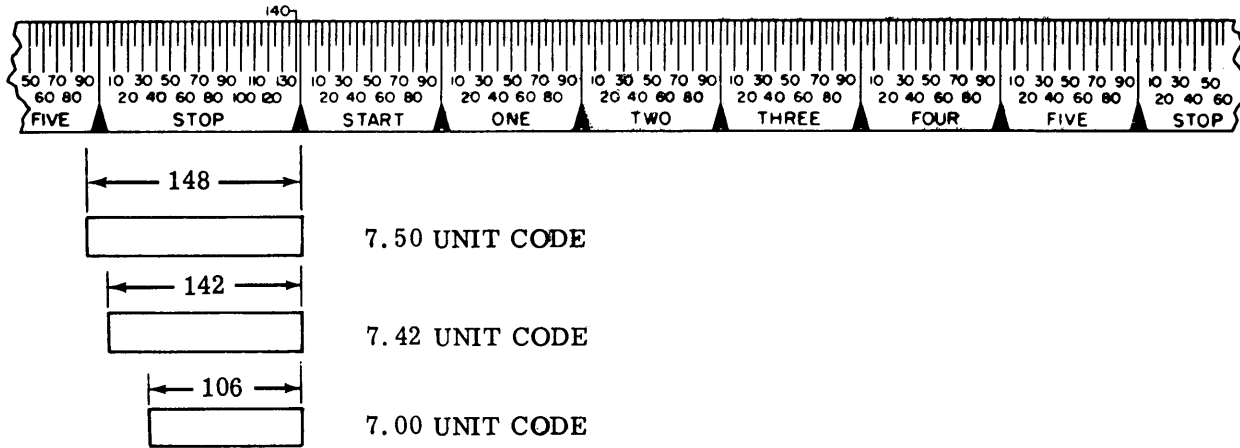


Figure 1 - Stop Pulse Length

Note: Four percent is equivalent to 4.24 scale divisions (7.00 unit code), 5.68 scale divisions (7.42 unit code), and 5.92 scale divisions (7.50 unit code).

- (c) Replace the "blank" perforated tape with an "R" perforated tape. Align the end of the stop pulse image with the 142 scale division on the stop segment of the test set scale.

Requirement (Figure 2, 3, or 4)

No. 2 and no. 4 pulse images equal in total length, within $\pm 4\%$ of each end of the no. 2 and no. 4 pulse image transition point on the test set scale (Table A).

To Adjust

Rotate the no. 2 and no. 4 contact adjusting screws to meet requirement.

- (d) Replace the "R" perforated tape with a "Y" perforated tape. Align the end of the stop pulse image with the 142 scale division on the stop segment of the test set scale.

Requirement (Figure 2, 3, or 4)

No. 1, no. 3, and no. 5 pulse images equal in total length within $\pm 4\%$ of each end of the no. 1, no. 3, and no. 5 pulse image transition points on the test set scale (Table A).

To Adjust

Rotate the no. 1, no. 3, and no. 5 contact adjusting screws to meet requirement.

Note 1: Four percent is equivalent to 4.24 scale divisions (7.00 unit code), 4.00 scale divisions (7.42 unit code), and 3.96 scale divisions (7.50 unit code).

Note 2: To determine the end of the no. 5 pulse image, it may be necessary to hold the stop contact open.

TABLE A

PULSE IMAGE TRANSITION POINTS ON TEST SCALE						
TEST SET SEGMENT	7.00 UNIT CODE		7.42 UNIT CODE		7.50 UNIT CODE	
	BEGIN AT SCALE DIV	END AT SCALE DIV	BEGIN AT SCALE DIV	END AT SCALE DIV	BEGIN AT SCALE DIV	END AT SCALE DIV
STOP	36 IN STOP SEGMENT	142 IN STOP SEGMENT	0 IN STOP SEGMENT	142 IN STOP SEGMENT	94 IN NO. 5 SEGMENT	142 IN STOP SEGMENT
1	6 IN NO. 1 SEGMENT	12 IN NO. 2 SEGMENT	0 IN NO. 1 SEGMENT	100 IN NO. 1 SEGMENT	99 IN START SEGMENT	98 IN NO. 1 SEGMENT

TABLE A (Continued)

2	12 IN NO. 2 SEGMENT	18 IN NO. 3 SEGMENT	0 IN NO. 2 SEGMENT	100 IN NO. 2 SEGMENT	98 IN NO. 1 SEGMENT	97 IN NO. 2 SEGMENT
3	18 IN NO. 3 SEGMENT	24 IN NO. 4 SEGMENT	0 IN NO. 3 SEGMENT	100 IN NO. 3 SEGMENT	97 IN NO. 2 SEGMENT	96 IN NO. 3 SEGMENT
4	24 IN NO. 4 SEGMENT	30 IN NO. 5 SEGMENT	0 IN NO. 4 SEGMENT	100 IN NO. 4 SEGMENT	96 IN NO. 3 SEGMENT	95 IN NO. 4 SEGMENT
5	30 IN NO. 5 SEGMENT	36 IN STOP SEGMENT	0 IN NO. 5 SEGMENT	100 IN NO. 5 SEGMENT	95 IN NO. 4 SEGMENT	94 IN NO. 5 SEGMENT

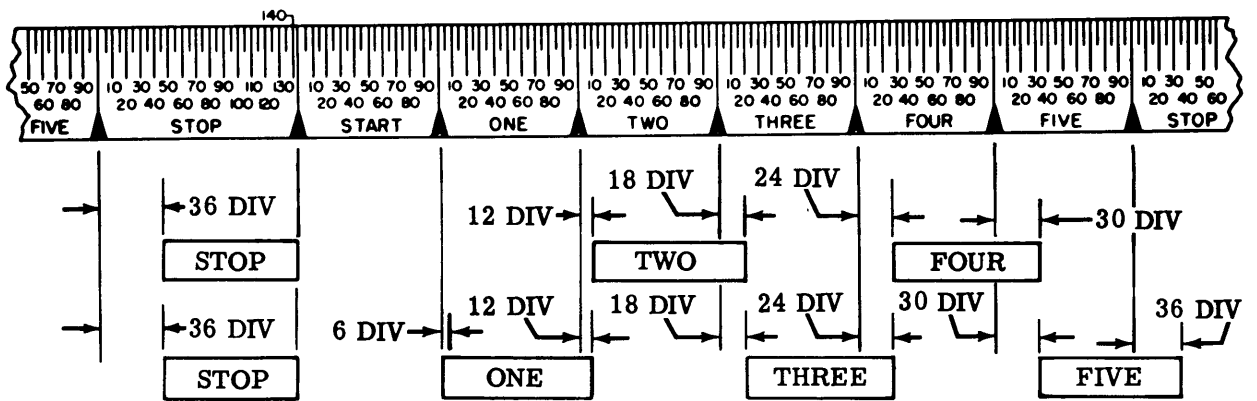


Figure 2 - Distributor Contacts No. 1 Through No. 5 — 7.00 Unit Code

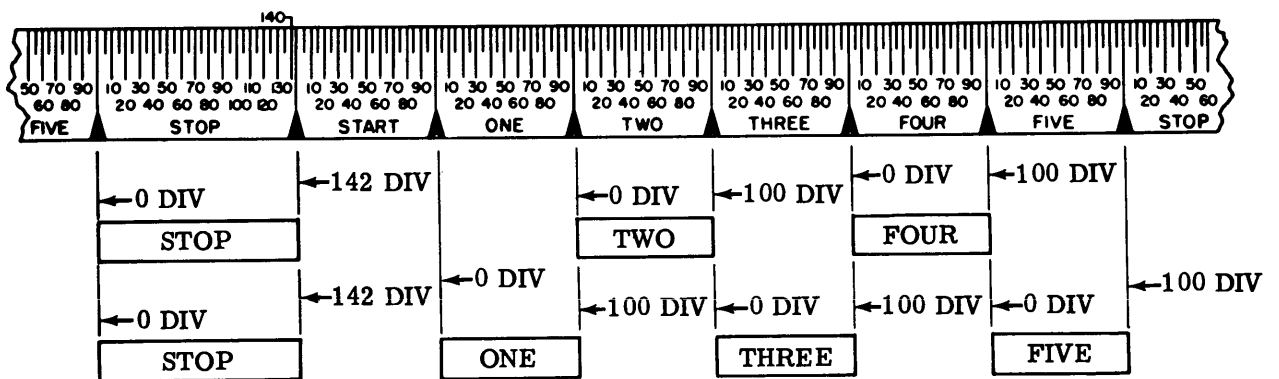


Figure 3 - Distributor Contacts No. 1 Through No. 5 — 7.42 Unit Code

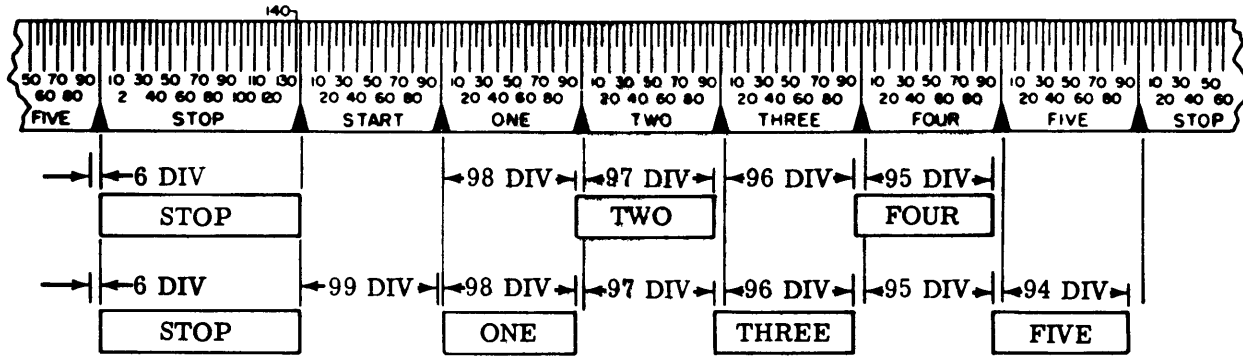


Figure 4 - Distributor Contacts No. 1 Through No. 5 — 7.50 Unit Code

3.11 Distributor Auxiliary Contacts "A" and "B" (Figure 5):

Note: Following requirements applicable for units transmitting 7.42 unit code at 368, 460, or 600 opm, and 7.50 unit code at 600 opm.

Align the end of the stop pulse image with the 142 scale division on the stop pulse segment of the test set scale.

Requirement (Auxiliary "A" Contact)

Auxiliary "A" contact should:
 Close at 32 ± 15 divisions in start segment
 Open at 29 ± 15 divisions in stop segment

Requirement (Auxiliary "B" Contact)

Auxiliary "B" contact should:
 Close at 25 ± 15 divisions in no. 1 segment
 Open at 75 ± 15 divisions in no. 5 segment

To Adjust

Rotate the distributor auxiliary "A" and "B" contact adjusting screws to meet requirements.

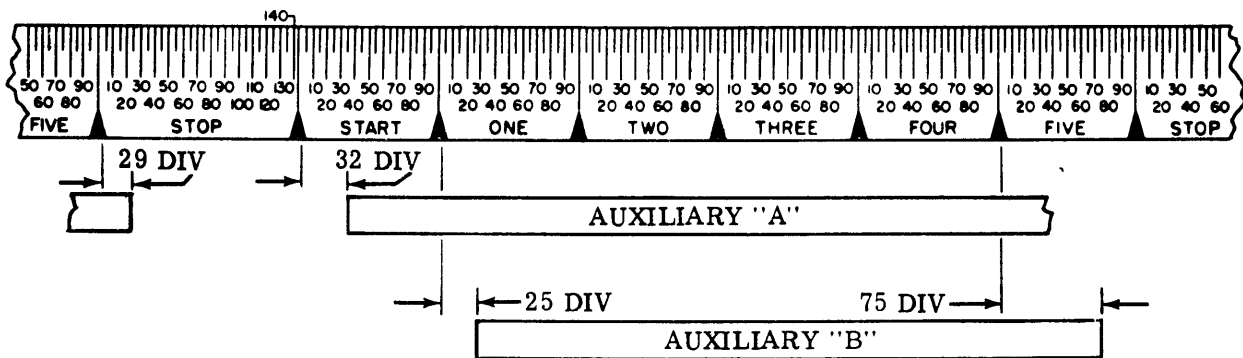


Figure 5 - Distributor Auxiliary "A" and "B" Contacts

3.12 Distributor Auxiliary Contacts "H" and "I" (Figure 6):

Note: Following requirements applicable for units transmitting 7.00 unit code at 390, 428, 636, and 642.9 (75 baud) opm.

Align the end of the stop pulse with the 142 scale division on the stop segment of the test scale.

Requirement (Auxiliary "H" Contact)

Auxiliary "H" contact should:
 Close at 68 ± 15 divisions in stop segment
 Open at 30 ± 15 divisions in start segment

Requirement (Auxiliary "I" Contact)

Auxiliary "I" contact should
 Close at 95 ± 15 divisions in start segment
 Open at 30 ± 15 divisions in no. 2 segment

To Adjust

Rotate the distributor auxiliary "H" and "I" contact adjusting screws to meet requirements.

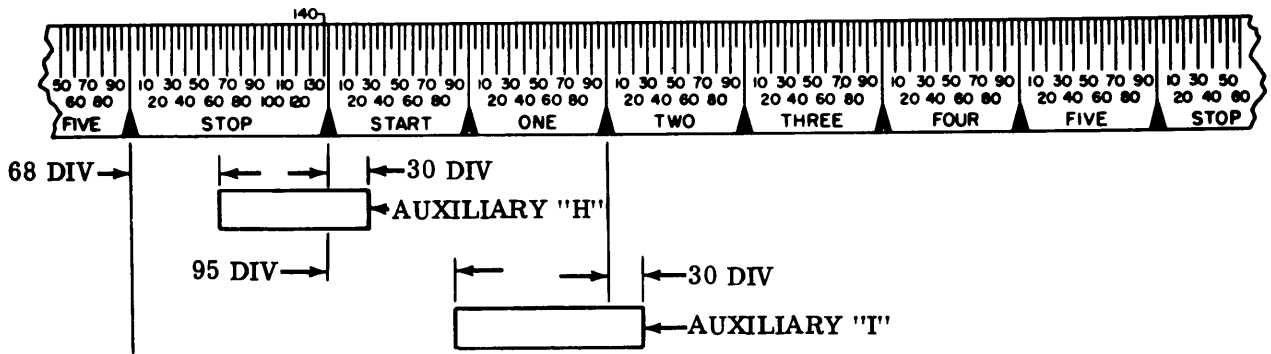


Figure 6 - Distributor Auxiliary "H" and "I" Contacts

3.13 Transmitter Contacts (Sensing) — No. 1 Through No. 5

- (a) Test set connected to the output of the distributor contacts.
- (b) Insert a "letters" perforated tape into the transmitter distributor sensing head. Align the end of the distributor stop pulse image with the 142 scale division on the stop segment of the test set scale.
- (c) Connect input of test set to respective contact (no. 1 through no. 5) of the storing switch.
- (d) Contacts no. 1 through no. 5 should have no electrical breaks during the transmitted (distributor) code pulses (see Table A for transition points) greater than 2-1/2 scale divisions at 600, 635, and 642.9 opm, 2 scale divisions at 428 and 460 opm, and 1-1/2 scale divisions at 368 and 390 opm. No more than one break is permissible.

Requirement (7.42 Unit Code Cam) (Figure 7)

At 600 OPM

The beginning and end of each contact trace should occur:
 Before 30 divisions in start segment
 After 49 divisions in stop segment

At 460 OPM

The beginning and end of each contact trace should occur:
 Before 45 divisions in start segment
 After 31 divisions in stop segment

At 368 OPM

The beginning and end of each contact trace should occur:
 Before 55 divisions in start segment
 After 25 divisions in stop segment

To Adjust

Position respective contact adjusting screw as necessary.

Note: Beginning and end of pulse image may overlap within transition area.

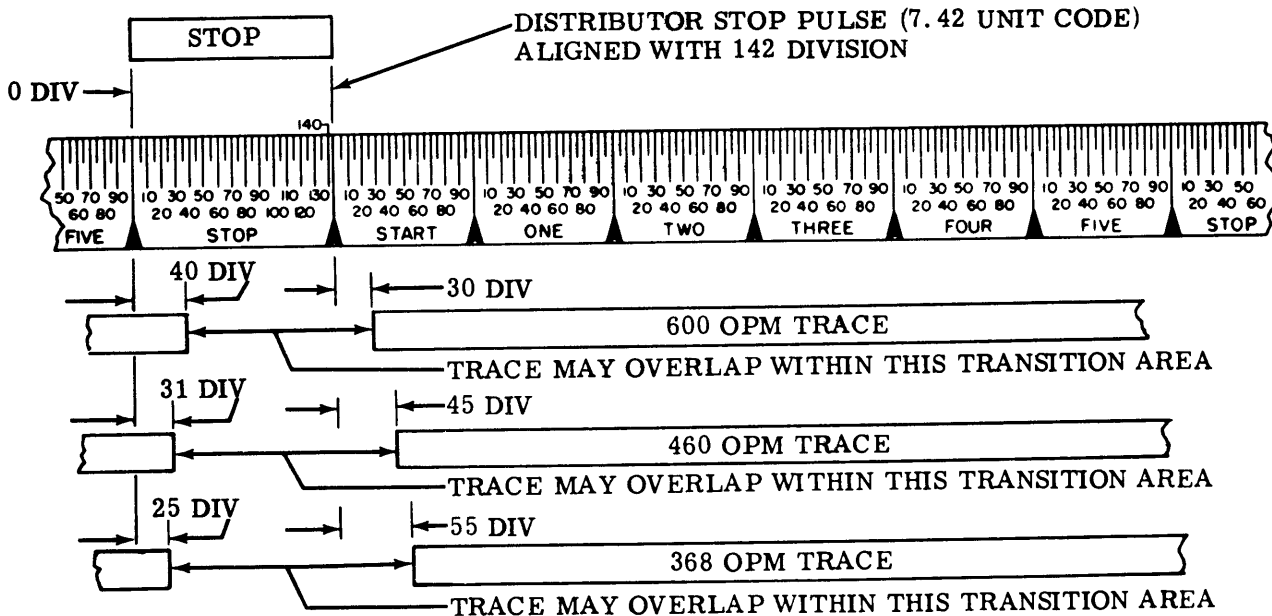


Figure 7 - Transmitter Contacts -- 7.42 Unit Code

Requirement (7.00 Unit Code Cam) (Figure 8)

At 636 and 642.9 OPM

The beginning and end of each contact trace should occur:
 Before 36 divisions in start segment
 After 76 divisions in stop segment

At 428 OPM

The beginning and end of each contact trace should occur:
 Before 61 divisions in start segment
 After 61 divisions in stop segment

At 390 OPM

The beginning and end of each contact trace should occur:
 Before 51 divisions in start segment
 After 67 divisions in stop segment

To Adjust

Position respective contact adjusting screw as necessary.

Note: Beginning and end of pulse image may overlap within transition area.

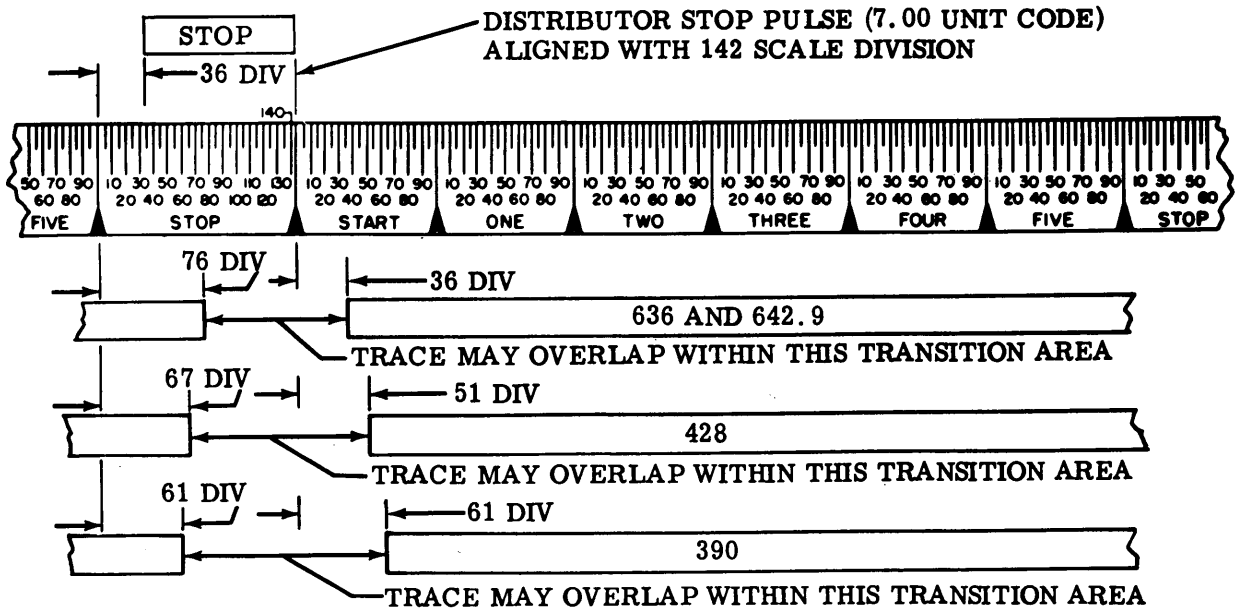


Figure 8 - Transmitter Contacts — 7.00 Unit Code

Requirement (7.50 Unit Code Cam) (Figure 9)

At 600 OPM

The beginning and end of each contact trace should occur:
 Before 29 divisions in start segment
 After 34 divisions in stop segment

Note: The beginning and end of pulse image may overlap within transition area.

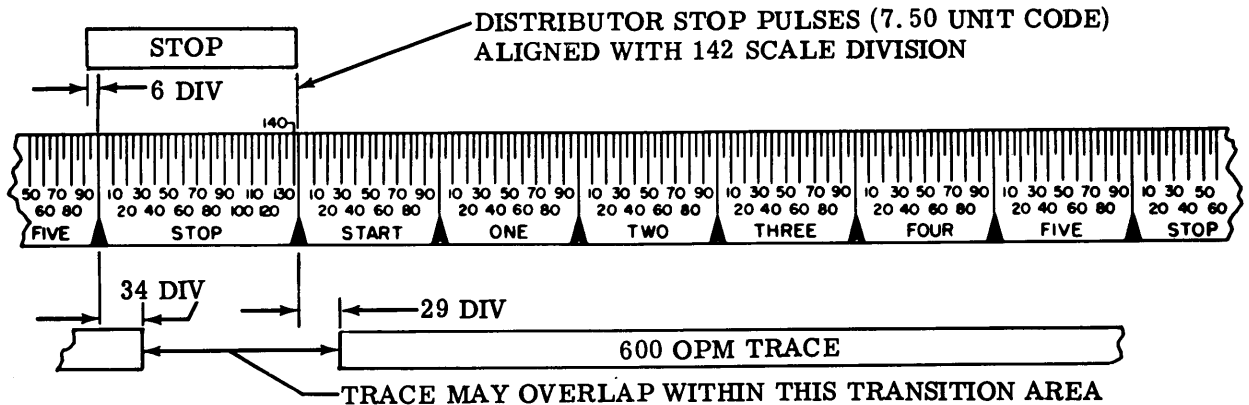


Figure 9 - Transmitter Contact — 7.50 Unit Code

3.14 Transmitter Contacts — Auxiliary, Tape-Out, and Distributor Clutch Trip

- (a) With both magnets de-energized, distributor, and transmitter shaft clutches latched in the stop position, turn motor off.
- (b) Hold distributor and transmitter shaft gears against rotation. Energize both clutch trip magnets.

SECTION 573-127-700TC

- (c) Release gears and turn motor on.
- (d) Align end of the distributor stop pulse image with the 142 scale division on the stop segment of the test set scale.
- (e) Pulse length requirements for 7.42 unit code operation at 368, 460, or 600 opm, and 7.50 unit code at 600 opm (Figure 10).

Requirement (Auxiliary Contact)

Auxiliary contact should:

Close at 12 ± 30 divisions in start segment

Open at 70 ± 30 divisions in no. 4 segment

Requirement (Tape-Out Contact)

With no tape in transmitter, tape-out contact should:

Close at 57 ± 40 divisions in no. 5 segment

Open at 63 ± 40 divisions in no. 3 segment

Requirement (Clutch Trip Contact)

With distributor clutch trip contact electrically isolated from circuit, clutch trip contact should:

Close at 18 ± 30 divisions in no. 4 segment

Open at 46 ± 30 divisions in no. 5 segment

To Adjust

Position respective contact adjusting screws or refine transfer contact adjustments as necessary.

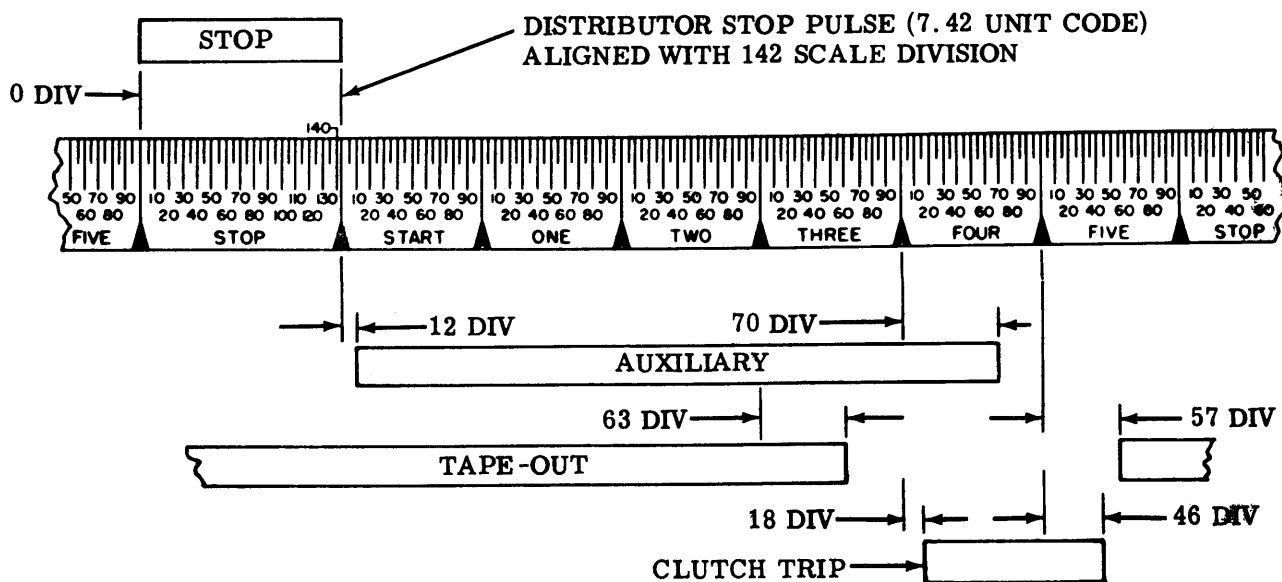


Figure 10 - Transmitter Auxiliary Contacts — 7.42 Unit Code

- (f) Pulse length requirements for 7.00 unit code at 390, 428 or 636 opm, and also 642.9 opm (75 baud) (Figure 11).

Requirement (Auxiliary Contact)

Auxiliary contact should:

Close at 48 ± 30 divisions in stop segment

Open at 41 ± 30 divisions in no. 4 segment

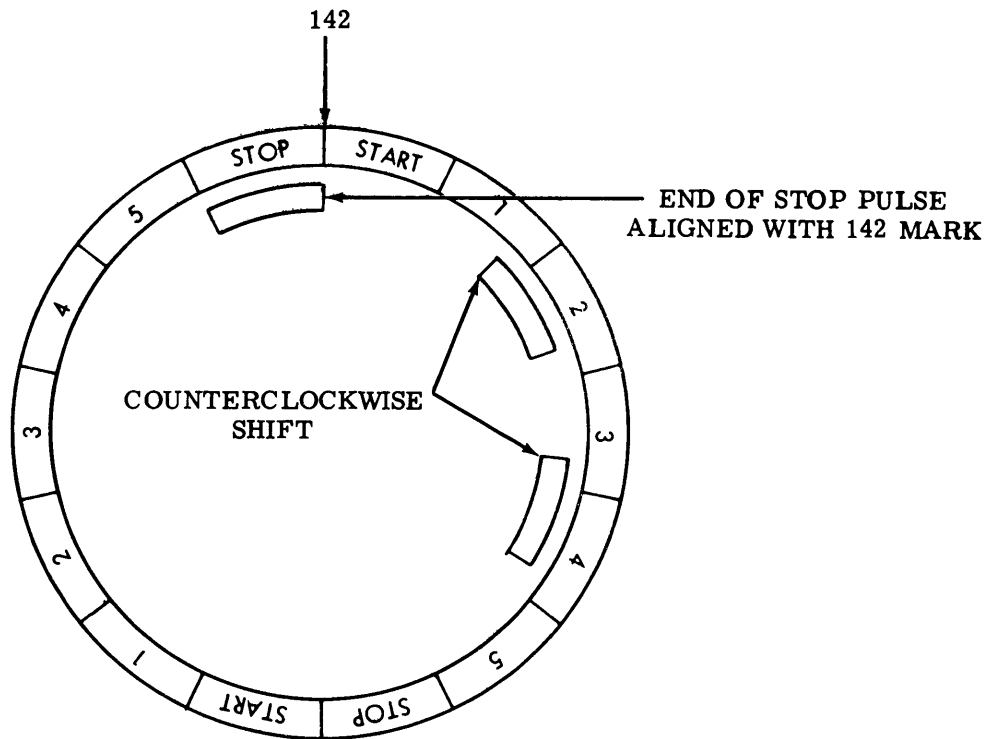


Figure 12 - Signal Shift

- (d) Replace the "R" perforated tape with a "Y" perforated tape. Align the end of one stop pulse image with the 142 scale division on the stop segment of the test set scale. Adjust the no. 1, no. 3, and no. 5 contacts as outlined in 3.10 (d), allowing $\pm 5\%$ pulse length variation.
- (e) Align end of second stop pulse image with the 142 scale division on the stop segment of the test set scale. Notice whether the signals appear to be shifted either clockwise or counterclockwise.
- (f) If a definite shift is noticed, reposition the test set scale so that the no. 1 through no. 5 images align as close as possible between their respective transition points (Table A). Some compromise will have to be made between the two cam halves.
- (g) Individually readjust the no. 1 through no. 5 contacts to obtain the required image pulse length. Readjust the stop pulse contact so the image is again aligned with the test set 142 scale division. Hold the beginning of the stop pulse to within $\pm 5\%$ of its stated starting point (Table A). Repeat steps (f) and (g) to obtain the best signal quality.

Note: When adjusting the length of individual pulse images, adjust them to be on the long side of their requirement. For example, in Figure 13 the short pulse image (90 divisions) is within requirements (100 divisions $\pm 5\%$ at each end for 7.42 unit code operation). By adjusting the pulse image to be 100 divisions long (normal length) — or even longer — it will still be within requirements, and will provide better operation of associated equipment in a switching system.

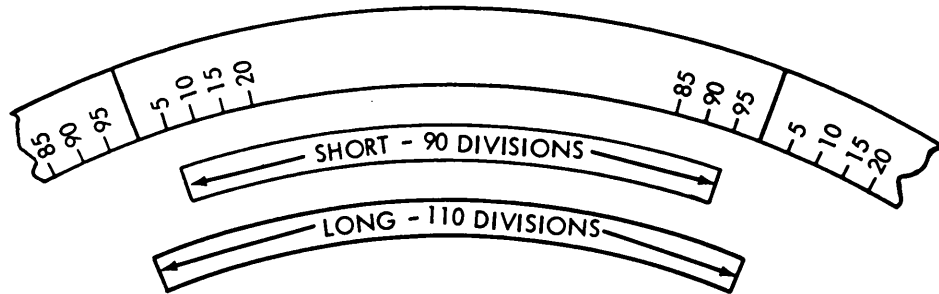


Figure 13 - Signal Adjustment

3.16 Distributor Auxiliary Contact "A":

Align the end of the stop pulse image with the 142 scale division on the stop segment of the test scale.

Requirement (Auxiliary "A" Contact) (Figure 14)

Auxiliary "A" contact should:

Close at 32 ± 15 divisions in start segment

Open at 29 ± 15 divisions in stop segment

To Adjust

Rotate distributor auxiliary "A" contact to meet requirements.

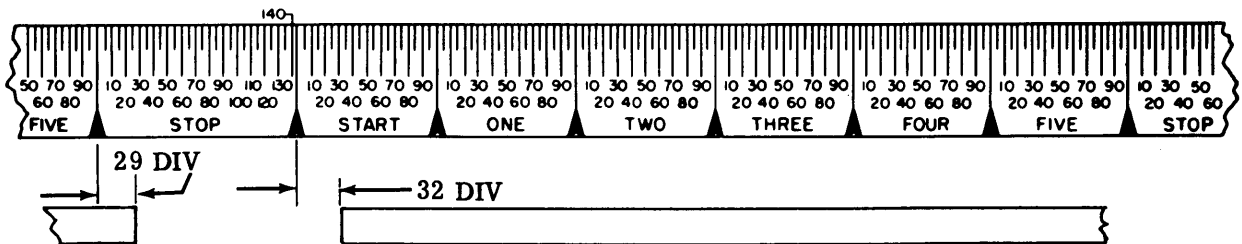


Figure 14 - Auxiliary "A" Contacts -- 2-Cycle Cam

3.17 Transmitter Contacts No. 1 Through No. 5:

- Test set connected to the output of the distributor contacts.
- Insert a "letters" perforated tape into the transmitter distributor sensing head. Align the end of the distributor stop pulse image with the 142 scale division on the stop segment of the test set scale.
- Connect input of test set to respective contact (no. 1 through no. 5) of the storing switch.

Requirement (Figure 15)

The beginning and end of each contact trace should occur:

Before 80 divisions in start segment

After 20 divisions in stop segment

To Adjust

Position respective contact adjusting screw as necessary.

Note: Beginning and end of pulse image may overlap within transition area.

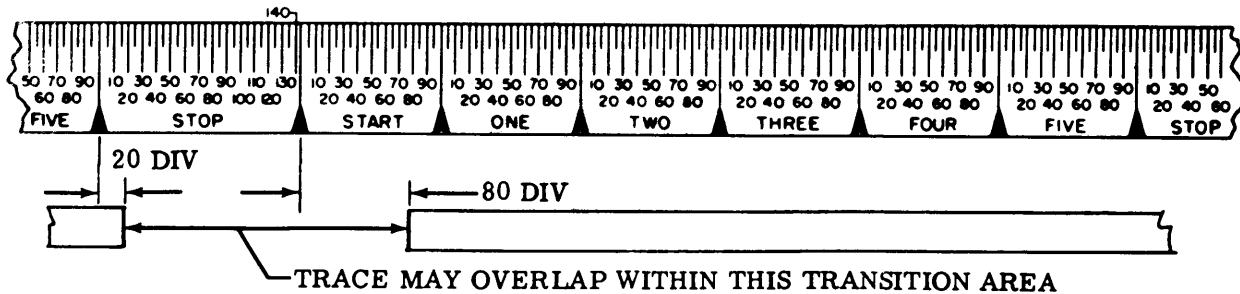


Figure 15 - Transmitter Contacts — 2-Cycle Cam

Note: Contacts no. 1 through no. 5 should have no electrical breaks during the required code pulse segments (see requirement above) greater than 5 scale divisions, or greater than 10 scale divisions if the break occurs within the transition area. No more than one break is permissible.

3.18 Transmitter Contacts — Auxiliary, Tape-Out, and Distributor Clutch Trip (Figure 16):

- With both magnets de-energized, distributor, and transmitter shaft clutches latched and in stop position, turn motor off.
- Hold distributor and transmitter shaft gears against rotation. Energize both clutch trip magnets.
- Release gears and turn motor on.
- Align end of distributor stop pulse image with the 142 scale division on the stop segment of the test set scale.

Requirement (Auxiliary Contact)

Auxiliary contact should:

Close at 12 ± 40 divisions in start segment

Open at 16 ± 40 divisions in no. 4 segment

Requirement (Tape-Out Contact)

With no tape in transmitter, tape-out contact should:

Close at 57 ± 40 divisions in no. 5 segment

Open at 63 ± 40 divisions in no. 3 segment

Requirement (Distributor Clutch Trip Contact)

With distributor clutch trip contact electrically isolated from circuit, contact should:

Close at 17 ± 40 divisions in no. 3 segment

Open at 73 ± 40 divisions in no. 5 segment

To Adjust

Position respective contact adjusting screw as necessary.

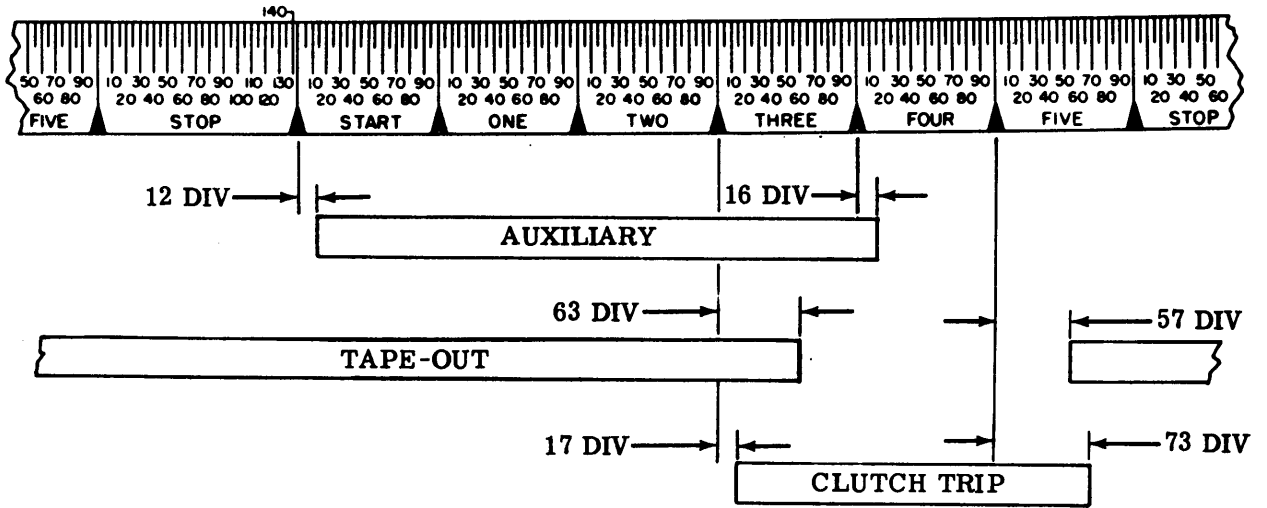


Figure 16 - Auxiliary, Tape-Out, and Distributor Clutch Trip Contacts --- 2-Cycle Cam

LCXD CONTACT STROBING — PIVOTED AND FIXED HEAD

Note: To strobe the distributor and sensing contacts, a Signal Distortion Test Set (DXD) or Stroboscopic Test Set (LSS) may be used. For operation of these sets, refer to Bulletin 181B or 261B, respectively.

3.19 Distributor Contacts — Stop and No. 1 Through No. 5 (368, 390, 428, 460, 600, and 635 OPM):

- (a) Connect a test set to the output of the distributor contacts. Test set and transmitter distributor must be operating at the same speed.
- (b) Insert a "blank" perforated tape into the transmitter distributor pivoted sensing head. Trip the sensing shaft clutch. (On some units, the sensing shaft clutch is tripped electrically via operation of the distributor shaft.) Orient the test set scale so the 142 mark of its stop segment is aligned with the end of the stop pulse image.

Requirement

Length of stop pulse to be:

- 106 scale divisions (+ 3%) for 7.00 unit code cam
- 142 scale divisions (+ 4%) for 7.42 unit code cam

To Adjust

Rotate the distributor stop contact adjusting screw to meet requirement.

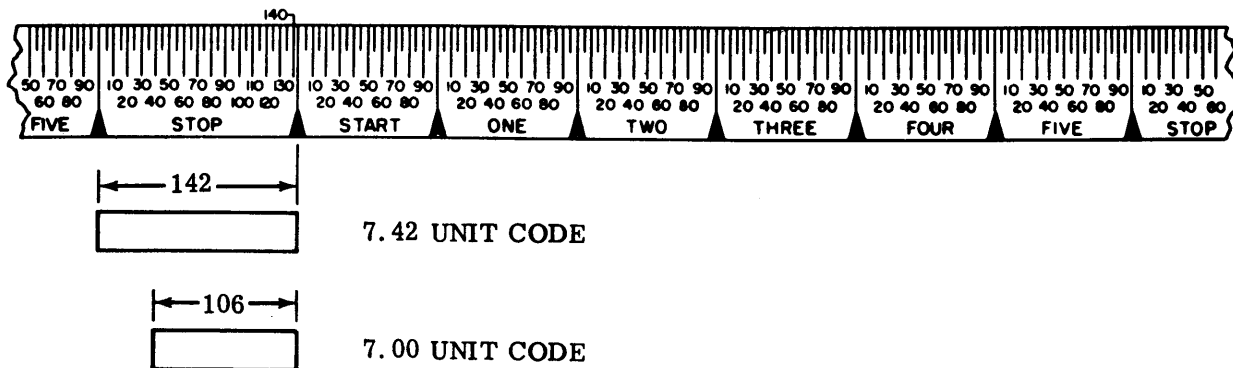


Figure 17 - Stop Pulse Length

Note: Three percent is equivalent to 3.18 scale divisions (7.00 unit code) and four percent is equivalent to 5.68 scale divisions (7.42 unit code).

- (c) Replace the "blank" perforated tape with the "R" perforated tape. Align the end of the stop pulse image with the 142 scale division on the stop segment of the test set scale.

Requirement

No. 2 and no. 4 images equal in total length within $\pm 4\%$ (7.42 unit code) or $\pm 3\%$ (7.00 unit code) of each end of the no. 2 and no. 4 pulse image transition point on the test set scale (Table A).

To Adjust

Rotate the no. 2 and no. 4 contact adjusting screws to meet requirement.

- (d) Replace the "R" perforated tape with a "Y" perforated tape. Align the end of the stop pulse image with the 142 scale division on the stop segment of the test set scale.

Requirement

No. 1, no. 3, and no. 5 pulse images equal in total length within $\pm 4\%$ (7.42 unit code) or $\pm 3\%$ (7.00 unit code) of each end of the no. 1, no. 3, and no. 5 pulse image transition points of the test set scale (Table A).

To Adjust

Rotate the no. 1, no. 3, and no. 5 contact adjusting screws to meet requirement.

Note 1: Three percent is equivalent to 3.18 scale divisions (7.00 unit code) and four percent is equivalent to 4.00 scale divisions (7.42 unit code).

Note 2: In order to determine end of no. 5 pulse image, it may be necessary to hold stop contact open.

TABLE B

PULSE IMAGE TRANSITION POINTS ON TEST SCALE

TEST SET SEGMENT	7.00 UNIT CODE		7.42 UNIT CODE	
	BEGIN AT SCALE DIV	END AT SCALE DIV	BEGIN AT SCALE DIV	END AT SCALE DIV
STOP	36 IN STOP SEGMENT	142 IN STOP SEGMENT	0 IN STOP SEGMENT	142 IN STOP SEGMENT
1	6 IN NO. 1 SEGMENT	12 IN NO. 2 SEGMENT	0 IN NO. 1 SEGMENT	100 IN NO. 1 SEGMENT
2	12 IN NO. 2 SEGMENT	18 IN NO. 3 SEGMENT	0 IN NO. 2 SEGMENT	100 IN NO. 2 SEGMENT
3	18 IN NO. 3 SEGMENT	24 IN NO. 4 SEGMENT	0 IN NO. 3 SEGMENT	100 IN NO. 3 SEGMENT
4	24 IN NO. 4 SEGMENT	30 IN NO. 5 SEGMENT	0 IN NO. 4 SEGMENT	100 IN NO. 4 SEGMENT
5	30 IN NO. 5 SEGMENT	36 IN STOP SEGMENT	0 IN NO. 5 SEGMENT	100 IN NO. 5 SEGMENT

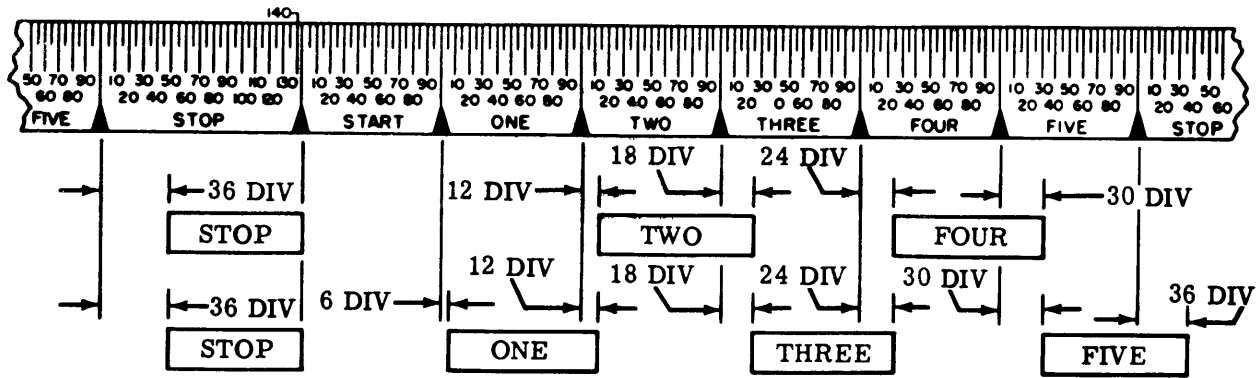


Figure 18 - Distributor Contacts No. 1 Through No. 5 Pulse Length Requirements for 7.00 Unit Code Operation at 390, 428, and 635 OPM (See Table B.)

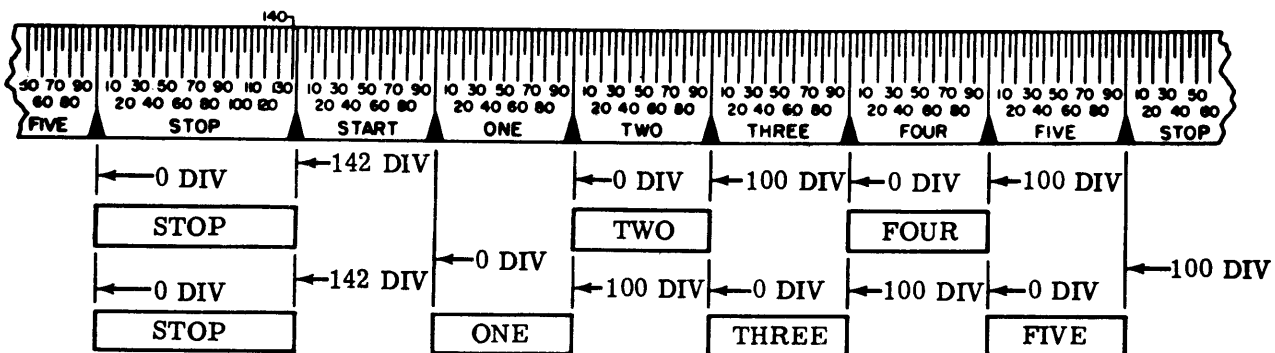


Figure 19 - Distributor Contacts No. 1 Through No. 5 Pulse Length Requirements for 7.42 Unit Code Operation at 368, 460, and 600 OPM (See Table B.)

3.20 Distributor Auxiliary Contacts "A", "B", and "C":

- (a) Following requirements are applicable for units transmitting 7.42 unit code at 368, 460, or 600 opm. Align the end of the stop pulse image with the 142 scale division on the stop segment of the test set scale.

Requirement (Auxiliary "A" Contact)

Auxiliary "A" contact should:

Close at 32 ± 15 divisions in start segment

Open at 29 ± 15 divisions in stop segment

Requirement (Auxiliary "B" Contact)

Auxiliary "B" contact should:

Close at 25 ± 15 divisions in no. 1 segment

Open at 75 ± 15 divisions in no. 5 segment

To Adjust

Rotate the distributor auxiliary "A" and "B" contact adjusting screws to meet requirements.

- (b) Following requirements applicable for units transmitting 7.00 unit code at 390, 428, or 635 opm.

Requirement (Auxiliary "C" Contact)

Auxiliary "C" contact should:

Close at 29.5 ± 5 divisions in start segment

Open at 48 ± 8 divisions in stop segment

To Adjust

Rotate the distributor auxiliary "C" contact adjusting screw to meet requirements.

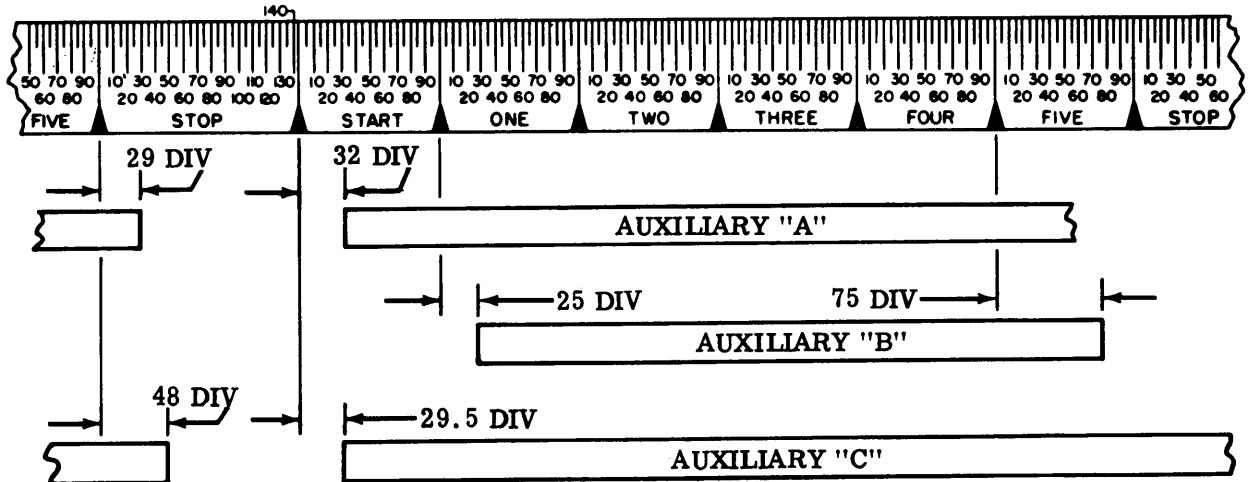


Figure 20 - Distributor Auxiliary "A", "B" and "C" Contacts

3.21 Transmitter Contacts (Sensing) — No. 1 Through No. 5:

- Connect test set to the output of the distributor contacts.
- Insert a "letters" perforated tape into the transmitter distributor sensing head. Align the end of the distributor stop pulse image with the 142 scale division on the stop segment of the test set scale.
- Connect input of test set to respective contact (no. 1 through no. 5) of the storing switch.

Note 1: In 7.42 unit code, contacts no. 1 through no. 5 should have no electrical breaks during the transmitted (distributor) code pulses (see Table B for transition points) greater than 2-1/2 scale divisions at 600 opm, 2 scale divisions at 460 opm, and 1-1/2 scale divisions at 368 opm. No more than one break is permissible.

Note 2: In 7.00 unit code, contacts no. 1 through no. 5 should have no electrical breaks during the transmitted (distributor) code pulses. (Any electrical breaks occurring within the + 3% tolerance limits of the distributor contacts are acceptable.) When reading successive marking code perforations, the time of contact opening should not exceed 1.5 ms.

Requirement (7.42 Unit Code Cam)

At 600 OPM

The beginning and end of each contact trace should occur:
 Before 30 divisions in start segment
 After 40 divisions in stop segment

At 460 OPM

The beginning and end of each contact trace should occur:
 Before 45 divisions in start segment
 After 31 divisions in stop segment

At 368 OPM

The beginning and end of each contact trace should occur:
 Before 55 divisions in start segment
 After 25 divisions in stop segment

To Adjust

Position respective contact adjusting screw as necessary.

Note: Beginning and end of pulse image may overlap within transition area.

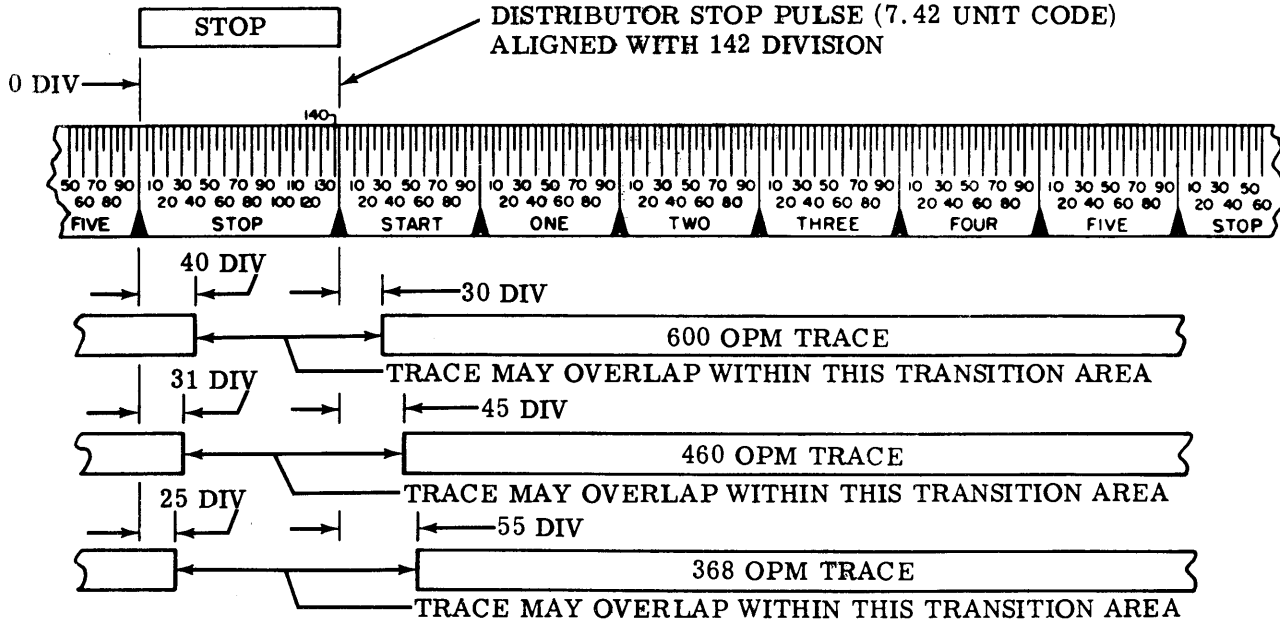


Figure 21 - Transmitter Contacts -- 7.42 Unit Code

Requirement (7.00 Unit Code Cam)

At 390, 428, or 630 OPM

The beginning and end of each contact trace should occur:

Before 80 divisions in start segment

After 20 divisions in stop segment

To Adjust

Position respective contact adjusting screw as necessary.

Note: Beginning and end of pulse image may overlap within transition area.

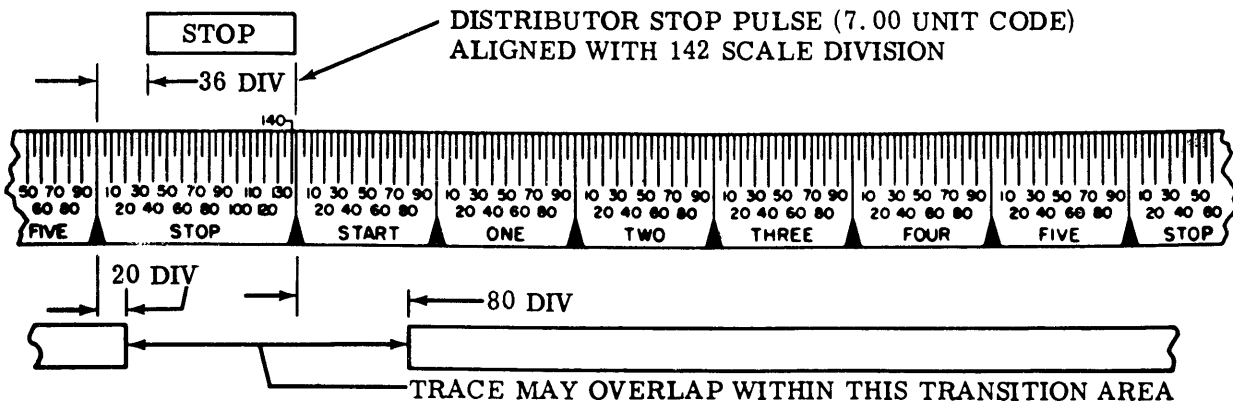


Figure 22 - Transmitter Contacts -- 7.00 Unit Code

3.22 Transmitter Contacts — Auxiliary, Tape-Out and Distributor Clutch Trip:

- (a) With both magnets de-energized, distributor and transmitter shaft clutches latched and in the stop position, turn motor off.
- (b) Hold distributor and transmitter shaft gears against rotation. Energize both clutch trip magnets.
- (c) Release gears and turn motor on.
- (d) Align the end of the distributor stop pulse image with the 142 scale division on the stop segment of the test set scale.
- (e) Pulse length requirements for 7.42 unit code operation at 368, 460, or 600 opm.

Requirement (Auxiliary Contact)

Auxiliary contact should:
 Close at 12 ± 30 divisions in start segment
 Open at 70 ± 30 divisions in no. 4 segment

Requirement (Tape-Out Contact)

With no tape in pivoted head transmitter, tape-out contact should:
 Close at 50 ± 30 divisions in no. 5 segment
 Open at 65 ± 30 divisions in no. 3 segment

Requirement (Clutch Trip Contact)

With distributor clutch trip contact electrically isolated from circuit, clutch trip contact should:
 Close at 18 ± 30 divisions in no. 4 segment
 Open at 46 ± 30 divisions in no. 5 segment

To Adjust

Position respective contact adjusting screws as necessary.

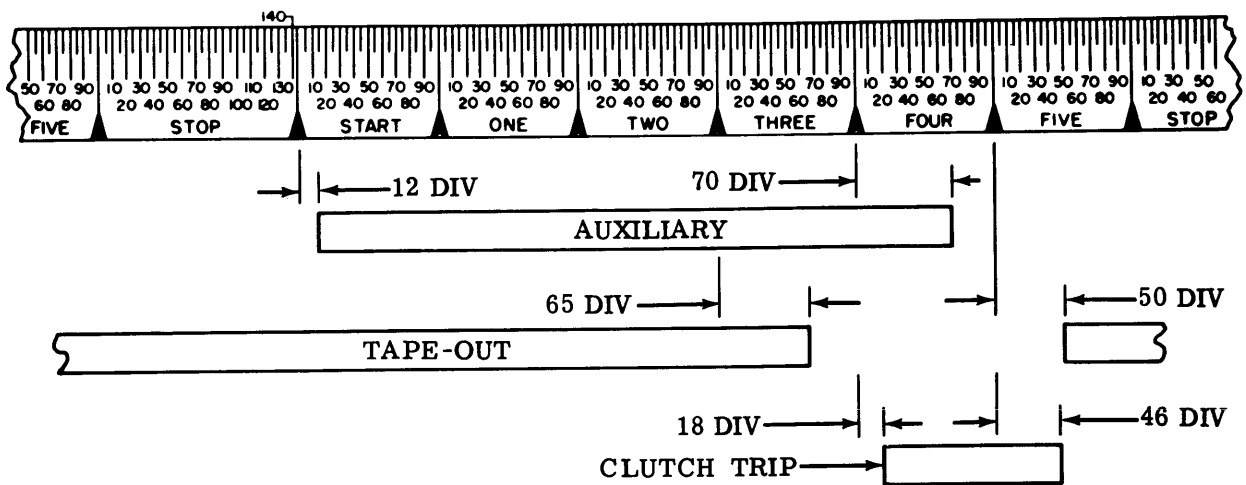


Figure 23 - Transmitter Auxiliary Contacts — 7.42 Unit Code

- (f) Pulse length requirements for 7.00 unit code at 390, 428 or 635 opm.

Requirement (Auxiliary "A" Contact)

Auxiliary "A" contact should:
 Close at 90 ± 8 divisions in no. 5 segment
 Open at 36.5 ± 20 divisions in no. 1 segment

Requirement (Auxiliary "B" Contact)

Auxiliary "B" contact should:
 Close at $83 + 12$ divisions in start segment
 Open at $33.5 + 8$ divisions in no. 4 segment

Requirement (Tape-Out — 6th Pin)

With no tape in transmitter, tape-out contact should:
 Close at $60 + 40$ divisions in no. 5 pulse
 Open at $35 + 40$ divisions in no. 3 pulse

To Adjust

Position respective contact adjusting screws as necessary.

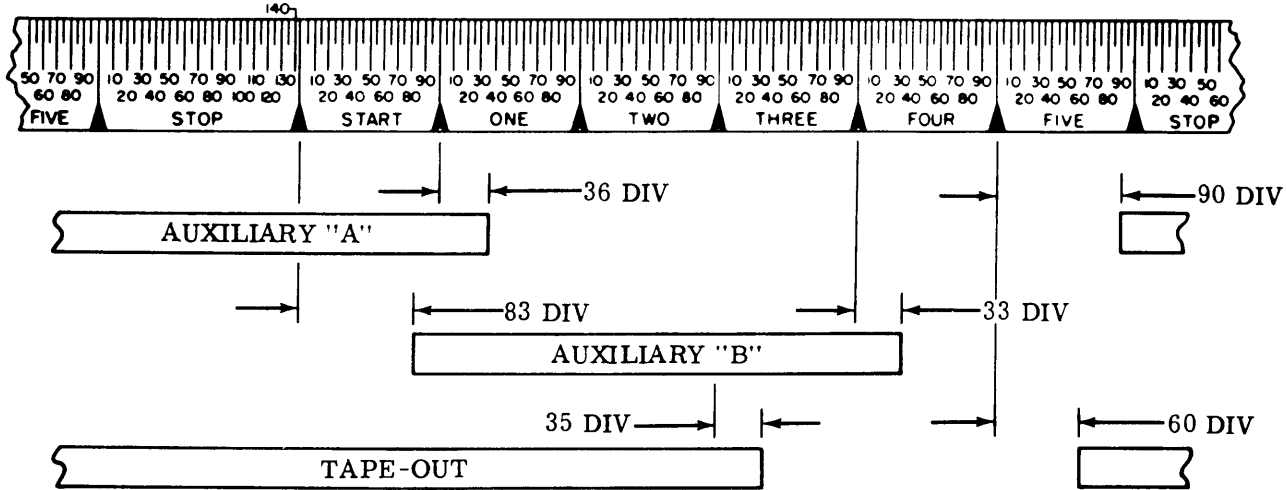


Figure 24 - Transmitter Auxiliary Contacts — 7.00 Unit Code

LCXD CONTACT STROBING — FIXED HEAD

3.23 Distributor Contacts — Stop and No. 1 Through No. 5 (368, 460, and 600 OPM):

Note: The following is merely a check on the operation of the fixed reader storing contacts, and no readjustments should be necessary. Any signal breaks may be due to dirt or oil on the contacts, or low contact pressure.

- (a) Insert a "blank" perforated tape into the transmitter distributor fixed sensing head. Trip the fixed reader sensing shaft clutch (on some units, the sensing shaft clutch may be tripped electrically via operation of the pivoted head distributor shaft).
- (b) Align the end of the stop pulse image with the 142 scale division on the stop segment of the set scale. (Refer to 3.19 (b).)
- (c) Recheck the distributor contacts according to the procedure in 3.19, 3.20, and 3.21.

3.24 Transmitter Contacts (Sensing) — No. 1 Through No. 5:

Check the no. 1 through no. 5 transmitter contacts according to the procedure given in 3.19.

3.25 Transmitter Contacts — Auxiliary and Distributor Clutch Trip:

- (a) With both magnets de-energized, pivoted reader distributor and fixed reader transmitter clutches latched and in the stop position, turn motor off.

- (b) Hold fixed reader transmitter and pivoted reader distributor shaft gears against rotation. Energize both clutch trip magnets.
- (c) Release gears and turn motor on.
- (d) Align the end of the distributor stop pulse image with the 142 scale division on the stop segment of the test set scale.
- (e) Pulse length requirement for 7.42 unit code operation at 368, 460, and 600 opm.

Requirement (Auxiliary Contact)

Auxiliary contact should:
 Close at 12 ± 30 divisions in start segment
 Open at 70 ± 30 divisions in no. 4 segment

Requirement

With distributor clutch trip contact electrically isolated from circuit, clutch trip contact should:
 Close at 39 ± 30 divisions in no. 4 segment
 Open at 67 ± 30 divisions in no. 5 segment

To Adjust

Position respective contact adjusting screws.

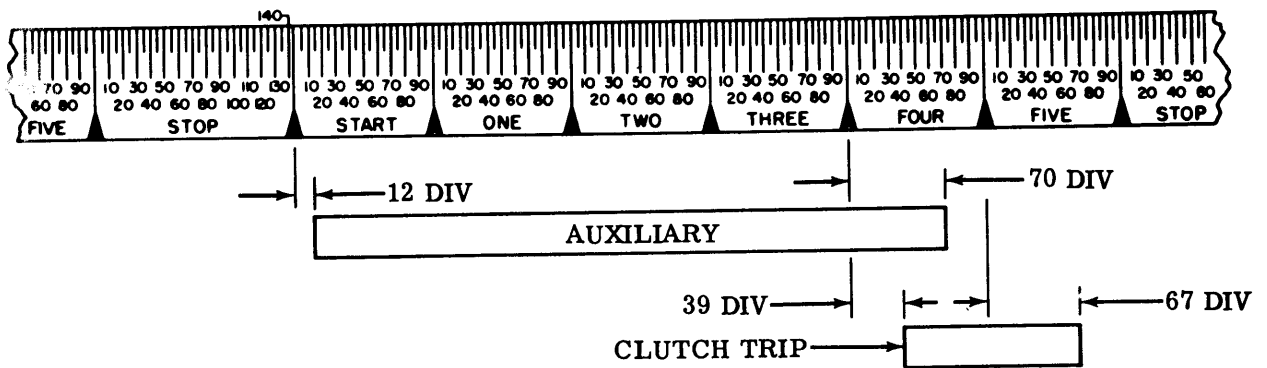


Figure 25 - Auxiliary and Distributor Clutch Trip Contacts

- (f) Pulse length requirement for 7.00 unit code operation at 390, 428, and 635 opm. Strobe contacts according to 3.22 (f).

