BULLETIN 252B

TECHNICAL MANUAL
28 TRANSMITTER DISTRIBUTORS
(PIVOTED AND FIXED HEAD MULTICONTACT)
(LAXD, LCXD)

TELETYPEx®
CORPORATION
5555 TOUHY AVENUE, SKOKIE, ILLINOIS
INTRODUCTION

Bulletin 252B provides adjustments, lubrication, and disassembly and reassembly procedures for Model 28 Transmitter Distributor Units (LAXD, LCXD).

The bulletin is now made up of a group of appropriate, independent sections. They are separately identified by title and section number, and the pages of each section are numbered consecutively, independent of other sections. The identifying number of a section, a 9-digit number, appears on each page of the section, in the upper left corner of left-hand pages and the upper right corner of right-hand pages.

To locate specific information, refer to the table of contents. Find the name of the involved component in column one and the title of the section in column two. The correct 9-digit section will then be found in column three. The sections are arranged in the order shown in the table of contents. Turn to page one of the section indicated where the contents of that section will be found (except where a section is small and does not require a listing of contents).

The sections comprising this bulletin are now stocked separately and may be individually ordered if the entire bulletin is not required.
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*Note:* For information on motor units, see Bulletin 295B.
# 28 TRANSMITTER DISTRIBUTOR UNITS (LAXD, LCXD)

## ADJUSTMENTS

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### 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 interrelated 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.
2.01 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.
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.

(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.

(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.
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.)

(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 latch lever on low part of clutch disc and unit upright. Scale applied to bent ear of latch lever horizontally.

Min 1/2 oz --- Max 1-1/2 oz to start latch lever 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.

(A) DISTRIBUTOR CAM FOLLOWER GUIDE

Requirement
At least one cam follower should engage cam by full thickness of the follower as follower is moved from side to side in its guide slot. Other cam followers should engage by 75 percent in same manner when play is taken up for a maximum. All cam followers should move freely in guide slots.

To Adjust
Position guide with cam follower guide mounting screws loosened. Recheck requirement.

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

(B) DISTRIBUTOR ROCKER COMPRESSION SPRINGS

Requirement
With compression springs installed, apply spring scale at lower end of rocker and push (vertically downward)

Min 6-1/2 oz --- Max 9-1/2 oz
to separate the contacts.

To Adjust
Rotate contact screws. (If the requirement cannot be met after compression springs are replaced, check rocker lever tension springs.)

(C) CAM FOLLOWER LEVER SPRING

Requirement
Cam follower lever on high part of cam. Scale applied just below sliding surface of lever horizontally.

Min 1/2 oz --- Max 1-1/2 oz
to start each lever moving.
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 guide post friction tight. High part of eccentric should be toward right. Hold eccentric and tighten guide post 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)

SENGING 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. Push lever held away.

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

(B) PUSHLEVER

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 push lever by
Min 0.020 inch --- Max 0.045 inch

To Adjust
With clutch in the stop position and with push lever 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 latch levers so that latch levers 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 pushlever 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 pushlevers 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

(B) TAPE DEFLECTOR

Requirement
The tape deflector vertical ears should pass freely between sensing pins 1 and 2 and 4 and 5 as pivoted sensing head is moved away from its locked position.

To Adjust
Position tape deflector with front pivot screw.

(A) SENSING HEAD PIVOT SCREWS

(1) Requirement
Sensing yoke should be free of binds.

To Adjust
Position rear pivot screw for minimum endplay without binding.

(2) Requirement
Sensing pins should move freely in top plate.

To Adjust
Refine Requirement (1).

(C) TAPE DEFLECTOR BRACKET

Requirement
Arms of deflector bracket should contact ears on tape deflector simultaneously with sensing yoke in fixed position.

To Adjust
Position deflector bracket with mounting screws loosened.
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 perforator 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

(A) TAPE DEPRESSOR SPRING

To Check
With tape depressor in locked position, apply scale to lip at extreme right end of depressor.

Requirement
Min 1/4 oz—Max 3/4 oz to start depressor moving.

(B) TAPE DEFLECTOR SPRING

Requirement
Min 1/4 oz—Max 1-1/4 oz to start deflector moving.

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

(A) LAST CHARACTER CONTACT SPRING
(Enclosed)

To Check
Remove switch cover.

(1) Requirement
Min some --- Max 0.010 inch
clearance between swinger button and
plunger when contacts are closed.

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

To Adjust
Remove contact assembly from unit. Bend
contact springs to meet requirements.

(B) LAST CHARACTER CONTACT ASSEMBLY
(Enclosed)

To Check
Transmitter distributor and reperforator
mounted in normal operating position. Tape
inserted in punch and pivoted reading head.

(1) Requirement
Min 0.010 inch --- Max 0.015 inch
clearance between tape deflector ear and
switch plunger when pivoted head is one
character away from punch block.

Note: Plunger must touch insulating
button.

(2) Requirement
Min 0.005 inch
clearance between contacts when pivoted
head is against punch block.

To Adjust
Position switch assembly with bracket mounting screws loosened. Replace switch cover.
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)

(B) TAPE-OUT PIN SPRING BRACKET

Requirement
Min 38 grams -- Max 45 grams
to depress tape-out pin until flush with
tape guideplate.

To Adjust
Position tape-out pin spring bracket
with its mounting screws friction tight.
Tighten screws and recheck require-
ment.

(A) TAPE-OUT AND TAPE LID SWITCH
BRACKET

Requirement
Min 0.006 inch -- Max 0.020 inch
clearance between tape-out pin exten-
sion and contact swinger insulator when
tape-out pin is held down.

To Adjust
Insert a length of unperforated tape
under tape lid. Adjust switch bracket
with its mounting screw loosened.

(C) TAPE-OUT AND TAPE LID PIN DOWN-
STOP

Requirement
When depressed to their lowermost
positions, tape-out and tape lid pins
should be flush to 0.005 inch below
surface of tape guideplate.

To Adjust
Position respective downstop post with
its mounting nut loosened.
2.33 Tape-Out and Tape Lid Pin Mechanism (LCXD Without Start-Stop Lever) (continued)

(D) TAPE LID PIN SPRING

Requirement
Min 1-1.2 oz---Max 3 oz
To move tape lid pin flush with top surface of top plate.

(E) TAPE LID PIN

To Check
Remove coverplate.

(2) Requirement
With tape lid open, and normally open contacts closed by tape lid pin
Min 0.010 inch clearance between shoulder on pin and bottom surface of tape guide-plate.

(1) Requirement
With tape lid closed
Min 0.005 inch clearance between tape lid pin and swinger insulator.

To Adjust
Loosen clampscrew to friction tight and adjust tape lid pin by means of its pry points.
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.

(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.
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 actuators 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:

\[ \text{Formula (2) \ wpm} = \frac{c}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}} \div 6 \frac{c}{\text{word}} \], or \ 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:

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

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} = 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.

<table>
<thead>
<tr>
<th>Operations Per Minute (opm)</th>
<th>Words Per Minute (wpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual</td>
</tr>
<tr>
<td>368</td>
<td>61.33</td>
</tr>
<tr>
<td>390</td>
<td>65.00</td>
</tr>
<tr>
<td>428.6</td>
<td>71.43</td>
</tr>
<tr>
<td>460</td>
<td>76.66</td>
</tr>
<tr>
<td>600</td>
<td>100.00</td>
</tr>
<tr>
<td>636</td>
<td>106.00</td>
</tr>
<tr>
<td>642</td>
<td>107.15</td>
</tr>
</tbody>
</table>

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:

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

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

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.

Page 43
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 ±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 ±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>
<thead>
<tr>
<th>TABLE A</th>
</tr>
</thead>
<tbody>
<tr>
<td>PULSE IMAGE TRANSITION POINTS ON TEST SCALE</td>
</tr>
<tr>
<td>TEST SET SEGMENT</td>
</tr>
<tr>
<td>BEGIN AT SCALE DIV</td>
</tr>
<tr>
<td>STOP</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

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
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.

3.12 Distributor Auxiliary Contacts "H" and "T" (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 $68 \pm 15$ divisions in stop segment
Open at $30 \pm 15$ divisions in start segment

Requirement (Auxiliary "I" Contact)
Auxiliary "I" contact should
Close at $95 \pm 15$ divisions in start segment
Open at $30 \pm 15$ 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 rpm, 2 scale divisions at 428 and 460 rpm, and 1-1/2 scale divisions at 368 and 390 rpm. 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.

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.
(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
Requirement (Clutch Trip Contact)
Clutch trip contact should:
Close at 45 ± 30 divisions in no. 4 segment
Open at 85 ± 30 divisions in no. 5 segment

Requirement (Tape-Out (6th pin))
See requirements for no. 1 through no. 5 transmitter contacts at applicable speed.

To Adjust
Position respective contact adjusting screws as necessary.

DISTRIBUTOR STOP PULSE (7.00 UNIT CODE)
ALIGNED WITH 142 SCALE DIVISION

Figure 11 - Transmitter Auxiliary Contacts — 7.00 Unit Code

LAXD CONTACT STROBING PROCEDURE — 2-CYCLE CAM

Note: To strobe a transmitter distributor operating at 1200 opm (200 wpm), replace the test set 1-cycle measuring scale with a 2-cycle scale. Refer to Bulletin 181B and 261B, respectively, for 200 wpm operation of the DXD and LSS test sets (not all LSS test sets require a measuring scale change in order to strobe units operating at 200 wpm).

3.15 Distributor Contacts — Stop and No. 1 Through No. 5:

(a) Adjust stop pulse length as outlined in 3.10. For 1200 opm operation, stop pulse length variation is increased from ± 4% to ± 5%.

(b) Replace "blank" perforated tape with an "R" perforated tape. View one half of the cam sleeve at a time. Align the end of one stop pulse image with the 142 scale division on the stop segment of the test scale. Adjust no. 2 and no. 4 contacts as outlined in 3.10 (c), allowing ± 5% pulse length variation.

(c) 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 (Figure 12).
(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.
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.

3.17 Transmitter Contacts 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.

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):

(a) With both magnets de-energized, distributor, and transmitter shaft clutches latched and in 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 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 ($\pm 3\%$) for 7.00 unit code cam
142 scale divisions ($\pm 4\%$) for 7.42 unit code cam

To Adjust
Rotate the distributor stop contact adjusting screw to meet requirement.

![Figure 17 - Stop Pulse Length](image)

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**

<table>
<thead>
<tr>
<th>TEST SET SEGMENT</th>
<th>7.00 UNIT CODE</th>
<th>7.42 UNIT CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BEGIN AT SCALE DIV</td>
<td>END AT SCALE DIV</td>
</tr>
<tr>
<td>STOP</td>
<td>36 IN STOP SEGMENT</td>
<td>142 IN STOP SEGMENT</td>
</tr>
<tr>
<td>1</td>
<td>6 IN NO. 1 SEGMENT</td>
<td>12 IN NO. 2 SEGMENT</td>
</tr>
<tr>
<td>2</td>
<td>12 IN NO. 2 SEGMENT</td>
<td>18 IN NO. 3 SEGMENT</td>
</tr>
<tr>
<td>3</td>
<td>18 IN NO. 3 SEGMENT</td>
<td>24 IN NO. 4 SEGMENT</td>
</tr>
<tr>
<td>4</td>
<td>24 IN NO. 4 SEGMENT</td>
<td>30 IN NO. 5 SEGMENT</td>
</tr>
<tr>
<td>5</td>
<td>30 IN NO. 5 SEGMENT</td>
<td>36 IN STOP SEGMENT</td>
</tr>
</tbody>
</table>
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.
3.21 Transmitter Contacts (Sensing) — No. 1 Through No. 5:

(a) Connect test set 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.

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.

DISTRIBUTOR STOP PULSE (7.42 UNIT CODE) ALIGNED WITH 142 DIVISION

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.

DISTRIBUTOR STOP PULSE (7.00 UNIT CODE) ALIGNED WITH 142 SCALE DIVISION

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 \( \pm 30 \) divisions in start segment
Open at 70 \( \pm 30 \) divisions in no. 4 segment

Requirement (Tape-Out Contact)
With no tape in pivoted head transmitter, tape-out contact should:
Close at 50 \( \pm 30 \) divisions in no. 5 segment
Open at 65 \( \pm 30 \) 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 \( \pm 30 \) divisions in no. 4 segment
Open at 46 \( \pm 30 \) divisions in no. 5 segment

To Adjust
Position respective contact adjusting screws as necessary.

![Diagram showing divisions and contact positions for 7.42 Unit Code.](image)

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 \( \pm 8 \) divisions in no. 5 segment
Open at 36.5 \( \pm 20 \) 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).
28 TRANSMITTER DISTRIBUTOR UNITS (LAXD, LCXD)

LUBRICATION

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Check pawl and feed wheel .... 6
Clutch assemblies ............. 5
Clutch trip assemblies ....... 2
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Feed mechanism ............... 10
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Oil reservoir assembly ...... 7
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Sensing mechanism .......... 8
Storing switch assemblies ... 3
Tape lid and tape guide ...... 14
Tape-out and tape lid mechanism ... 15
Tight-tape sensing mechanism .. 14

1. GENERAL

1.01 This section provides lubrication information for the 5-level, 28 transmitter distributor units (LAXD, LCXD).

CAUTION: THE UNIT IS SHIPPED WITH THE OIL RESERVOIR EMPTY. REMOVE COVER PLATE FOR ACCESS AND FILL OIL RESERVOIR AS INDICATED IN 2.08, OIL RESERVOIR ASSEMBLY.

1.02 In this section, the general areas of the unit are shown by photographs. The specific points of lubrication are indicated by line drawings and descriptive text. The symbols in the text indicate the following directions:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1</td>
<td>Apply one drop of oil.</td>
</tr>
<tr>
<td>O2</td>
<td>Apply two drops of oil, etc.</td>
</tr>
<tr>
<td>G</td>
<td>Apply thin coat of grease.</td>
</tr>
<tr>
<td>SAT</td>
<td>Saturate with oil (felt washers, oilers, etc.)</td>
</tr>
</tbody>
</table>

1.03 Use KS7470 oil and KS7471 grease at all locations and surfaces indicated.

1.04 The units should be thoroughly lubricated, but over-lubrication which allows oil to drip or grease to be thrown on other parts, must be avoided. Exercise special care to prevent lubricant from getting between armature and pole faces. Keep all electrical contacts free from oil or grease.

1.05 The following general instructions supplement the specific lubricating points illustrated in this section.

(a) Apply one drop of oil to all spring hooks.
(b) Apply a light film of oil to all cam surfaces.
(c) Apply a coat of grease to all gears.
(d) Saturate all felt washers, oilers, etc.
(e) Apply oil to all pivot points.
(f) Apply oil to all sliding surfaces.

1.06 The transmitter distributor units should be lubricated before being placed in service or prior to storage. After a few weeks of service, relubricate to make certain that all specified points have received lubricant. Thereafter, the following schedule should be adhered to:

<table>
<thead>
<tr>
<th>Operating Speed</th>
<th>Lubrication Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 wpm</td>
<td>3000 hours or 1 year*</td>
</tr>
<tr>
<td>75 wpm</td>
<td>2400 hours or 9 months*</td>
</tr>
<tr>
<td>100 wpm</td>
<td>1500 hours or 6 months*</td>
</tr>
</tbody>
</table>

*Whichever occurs first.

1.07 For information pertaining to lubrication of associated parts, ie, motors, bases, etc, refer to appropriate sections.
2. LUBRICATION

2.01 Clutch Trip Assemblies

- O1 Hooks - Each End
- SAT Felt Washers
- O2 Pivot Points
- O1 Hooks - Each End
- SAT Felt Washers
- O1 Pivot Points
- O1 Hooks - Each End
- SAT Oil Wick

Antibacklash Spring
Clutch Trip Lever
Clutch Trip Lever
Antibacklash Lever
Armature Bail Spring
Armature Shaft
Armature Shaft
Clutch Trip Lever
Spring
Clutch Trip Lever
Spring
2.02 Storing Switch Assemblies

Note: Keep contacts free of grease.
G  Pivot Points  Contact Levers
G  Contact Points  Contact Levers
O1 Camming Surface  Cam Follower Lever
O1 Guide Slots  Cam Follower Lever
O1 Hooks - Each End  Cam Follower Lever Springs
O1 Loops  Compression Spring
O2 Pivot Point  Cam Follower Lever
2.04 Clutch Assemblies

2.05 Cam Sleeve Assemblies
2.06 Pivoted Sensing Head

- Pivot Point: Tape Depressor
- Hooks - Each End: Tape Depressor Spring
- Hooks - Each End: Tape Deflector Spring
- Pivot Points: Yoke and Tape Deflector
- Pivot Point: Tape Lid

2.07 Check Pawl and Feed Wheel

- Pivot Points: Feed Wheel
- Felt Washers: Feed Wheel
- Teeth: Feed Wheel Ratchet
- Pivot Point: Check Pawl
- Hooks - Each End: Check Pawl Spring
2.08 Oil Reservoir Assembly

Note: Oil depth not to exceed 7/8 inch. Use a 0.010 inch flat gauge from TP117781 set of gauges as a dip stick.
2.09 Sensing Mechanism

- O1: Sliding Surfaces
- SAT: Felt Washer
- O1: Hooks - Each End
- O1: Hooks - Each End
- SAT: Pivot Point
- O2: Pivot Point
- O2: Pivot Point
- O2: Pivot Point
- SAT: Felt Washer
- O1: Hooks - Each End
- SAT: Felt Washer
- O1: Hooks - Each End
- SAT: Felt Washer
- O2: Pivot Point

- Sensing Pins
- Cam Follower Roller
- Auxiliary Lever Spring
- Sensing Bail Spring
- Sensing Pin
- Sensing Pin
- Sensing BailSENSING Pins
- Pusher Stripper Bail Spring
- Pusher Stripper Ball
- Cam Follower Roller
- Latch Stripper Bail Spring
- Cam Follower Roller
- Latch Stripper Bail
2.10 Sensing Mechanism (continued)

- Pivot Points
- Auxiliary Levers
- Hooks - Each End
- Auxiliary Lever Spring
- Sliding Surfaces
- Pushlevers
- Hooks - Each End
- Pushlever Springs
- Pivot Points
- Pushlevers

- Sliding Surface
- Latchlevers
- Hooks - Each End
- Latchlever Spring
- Bearing Surface
- Latchlever and Pushlever
- Hooks - Each End
- Pushlever Spring
- Engaging Surface
- Latchiever
2.11 Feed Mechanism

- SAT: Felt Washers
- Pivot Shaft
- SAT: Felt Washer
- Feed Lever
- O1: Sliding Surface
- Feed Lever
- O1: Hooks - Each End
- Feed Lever Spring
- SAT: Felt Washer
- Cam Follower Roller
- O2: Pivot Point
- Feed Lever
2.12  Fixed Sensing Mechanism

- Sliding Surface
- Sliding Pins
- Hooks - Each End
- Sensing Bail Springs
- Pivot
- Sensing Pin Assembly
- Hooks - Each End
- Sensing Pin Springs
- Pivot Point
- Sensing Pin
- Engaging Surface
- Sensing Ball
- Felt Wick
- Cam Follower Roller
- Cam Surface
- Sensing Cams
- Pivot Point
- Sensing Bail
- Sensing Pins
2.13 Cam Sleeve Assemblies (continued)

- **G** Gears (2) Clutch
- **O2** Bearings (4) Clutch Shafts
- **SAT** Felt Wicks Idler Gear Shaft
- **O3** Oil Holes (2) Cam Sleeve
  (Opposite Side)
- **O3** Oil Holes (2) Cam Sleeve
  (Opposite Side)
- **SAT** Felt Washers (6) Cam Sleeve

Page 12
2.14  Feed Mechanism (continued)

- O1: Ratchet Teeth
- O1: Shaft
- SAT: Felt Wicks
- O2: Detent Roller
- O1: Hooks - Each End
- O1: Pivot Point
- O1: Hooks - Each End
- O1: Engaging Surface
- O2: Pivot Points
- O1: Guide Slot
- SAT: Felt Washer
- O1: Hooks - Each End
- SAT: Felt Washer
- O2: Pivot Point
- Feed Wheel
- Feed Wheel
- Ratchet
- Feed Wheel
- Feed Wheel
- Feed Wheel
- Feed Pawl Spring
- Detent Lever
- Spring
- Feed Lever Extension
- Feed Lever Bail
- Feed Lever
- Feed Lever Shaft
- Feed Lever Spring
- Cam Follower Roller
- Feed Lever
2.15  Tape Lid and Tape Guide

G  Teeth  Start-Stop Lever
SAT  Felt Washer  Tape Lid Shaft

O1  Each Loop  Start-Stop Detent Ball
O1  Bearing Surface  Tape Lid Release Ball

G  Latching Surface  Tape Lid Latch
O1  Each Loop  Tape Lid Latch Spring

2.16  Tight-Tape Sensing Mechanism

O1  Pivot Point  Tight-Tape Bail
O1  Sliding Surface  Tight-Tape Bail
O1  Pivot Point  Intermediate Bail
O1  Hooks - Each End  Yield Spring
O1  Pivot Point  Slide Arm Assembly
G  Pivot Point  Slide Arm
O1  Pivot Point  End of Slide Arm
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2.17 Tape-Out and Tape Lid Mechanism

- O1: Sliding Surface
- G: Contact Point
- O1: Hooks - Each End
- O2: Guide Slot
- Tape-Out Pin
- Tape-Out Pin Extension
- Spring
- Tape-Out Pin Guide Post

- O1: Sliding Surface
- O2: Guide Slot
- Tape Lid Pin
- Tape Lid Pin Guide Post
28 TRANSMITTER DISTRIBUTOR UNITS (LAXD, LCXD)

DISASSEMBLY AND REASSEMBLY

1. GENERAL

1.01 This section provides instructions and procedures for the disassembly and reassembly of the transmitter distributor units LAXD and LCXD. These instructions and procedures are arranged in a sequence which should be followed to disassemble the transmitter distributors into their main subassemblies or when a complete disassembly of one unit or both units is required.

1.02 For additional information on main subassemblies, refer to the appropriate parts section for associated illustrations.

Reassembly Note: Guide the mounting screws into the notches in the front and rear plates in the unit. Align and adjust the tape-guide plate position.

1.03 The covers, of the transmitter distributors, may be removed for inspection and minor repair. However, for complete disassembly and ease of assembly, the removal of the entire unit from its subbase is necessary.

1.04 To reassemble, reverse the disassembly procedures.

1.05 Unless otherwise indicated, the disassembly procedures of this section are common to both transmitter distributor units.

2. DISASSEMBLY

2.01 Cover Plate Assembly (Fixed Head): Lift the left end upward and slide the plate to the left to disengage the spring clip.

2.02 Top Plate Assembly (Fixed Head): Loosen the front and rear mounting screws and lift the plate upward.

Reassembly Note: Guide the mounting screws into the notches in the front and rear plates in the unit. Align and adjust the top plate position.

2.03 Tape-Guide Plate Assembly (Fixed Head): Loosen the front and rear mounting screws and slide the plate upward.

2.04 Cover Plate Assembly (Pivoted Head):

(1) Loosen the captive screw on top.

(2) Loosen the two mounting screws on the left.

(3) Lift the plate up.

2.05 Idler Gear Assembly:

(1) Remove the feed lever spring and latch stripper ball spring.

(2) Remove the oil reservoir bar assembly by removing the screws, lockwashers, and flat washers holding the bar to its mounting bracket.

(3) Pull out the idler gear oil retainer plug and remove the leather washer.

(4) Remove the idler gear bearing stud locknut, lockwasher, and flat washer.

(5) Remove as a unit the idler gear bearing stud, idler gear, and spacer (if used).

2.06 Sensing Shaft Assembly (Pivoted Head):

(1) Remove the idler gear assembly as covered in 2.05.

(2) Remove the front bearing clamp by removing the three mounting screws and lockwashers.

(3) Remove the rear bearing clamp by removing the two mounting screws and lockwashers.

(4) Remove the sensing shaft assembly.
2.07 Distributor and Sensing Shaft Assembly (Pivoted and Fixed Head): Follow the procedure for removing the sensing shaft assembly.

2.08 Distributor Shaft Assembly (Pivoted Head): Follow the procedure for removing the sensing shaft assembly.

2.09 Clutch Trip Assembly:

(1) Disconnect the wires leading to the clutch magnet.

(2) Remove the mounting plate mounting screw, lockwasher, and flat washer and the mounting plate adjusting screw, lockwasher, and flat washer.

(3) Withdraw the clutch trip assembly from the bottom of the unit.

2.10 Pivot Shaft:

(1) Remove the sensing shaft assembly or the distributor and sensing shaft assembly as covered in previous paragraphs.

(2) Remove the two ring retainers, one of which is hidden under a felt washer.

(3) Loosen the feed lever collar setscrews.

(4) Remove the pivot shaft nut, lockwasher, and flat washer.

(5) Remove the pivot shaft by pushing it toward the rear plate, being careful not to lose the feed lever collars and felt washers.

2.11 Pivoted Sensing Head and Tape Deflector:

(1) Remove the last character contact assembly.

(2) Remove the check pawl spring.

(3) Remove the tape deflector spring.

(4) Loosen the rear pivot screw locknut and screw the rear pivot screw as far as possible into the casting.

(5) Pull the sensing pins down and free from the top plate.

(6) Loosen the front pivot screw locknut.

(7) Turn the front pivot screw until the tape deflector is free from the pivot screw.

(8) Remove the sensing head and tape deflector.

2.12 Storing Switch Assembly:

(1) Disconnect the electrical cable assembly.

(2) Remove the four mounting screws, lockwashers, and flat washers.

(3) Remove the storing switch assembly.

2.13 Distributor Block Assembly:

(1) Disconnect the electrical cable assembly.

(2) Remove the three mounting screws, lockwashers, and flat washers.

(3) Remove the distributor block assembly.
Figure 1 - Typical Transmitter Distributor (LCXD) with Top Plates Removed

Figure 2 - Typical Transmitter Distributor (LAXD)