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1. GENERAL

1.01 This section contains the requirements and adjusting procedures for the maintenance of the 28F, 28G, 28LA, and 28LB transmitter-distributor units.

1.02 This section is reissued to include adjustment information for modification kits which have been approved for use with these transmitter-distributor units, and to bring all adjustment information up to date.
1.03 In this section left or right, front or rear, and top or bottom apply to the apparatus in its normal operating position as viewed from the front.

1.04 When the requirement calls for the clutch to be disengaged, the clutch-shoe lever must be fully latched between its trip lever and latch lever 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 either the sensing or distributor shaft is rotated by hand, the clutch does not fully disengage upon reaching its stop position. In order to relieve the drag on the clutch and permit the main shaft to rotate freely, apply pressure on a lug of the clutch disc with a screwdriver to cause it to engage its latch lever and thus disengage the internal-expansion clutch shoes.

1.05 The covers may be removed for inspection and minor repair of the unit; however, when more extensive maintenance is to be undertaken, it is recommended that the unit be removed from its subbase to disconnect the power and to permit the unit to be inverted. Separate the unit from its subbase by sliding the unit toward the front to disconnect the electrical connectors and then lift upward.

1.06 In addition to the usual teletypewriter tools and materials, the following are required to maintain the transmitter-distributor units with pull-back mechanism.

(a) TP172060 Adjusting Tool: To bend the storing switch mechanism, transfer-type reading contacts.

(b) TP170283 Gauge: To adjust the tape guide.

(c) 28B Stroboscopic Test Set: To check contact-timing measurements.

1.07 Unless otherwise indicated, the requirements and adjustments in 2. of this section are common to the units both with and without the pull-back mechanism.

2. REQUIREMENTS AND ADJUSTMENTS

2.01 The following figures show the adjusting tolerances, positions of moving parts, and spring tensions. The illustrations are arranged so that the adjustments are in the sequence that would be followed if a complete readjustment of the apparatus were being made. In some cases 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 1: REQUIREMENTS 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 REQUIREMENTS 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 OZS. MAX. 20 OZS.
TO MOVE CLUTCH-SHOE LEVER IN CONTACT WITH STOP LUG.

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 OZS. MAX. 5 OZS.
TO START PRIMARY SHOE MOVING AWAY FROM SECONDARY SHOE AT POINT OF CONTACT.
2.03 Cam Shafts

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 ENDPAY

NOTE 2
MAKE THIS ADJUSTMENT PRIOR TO ASSEMBLING GEAR.
REQUIREMENT
MIN. SOME
MAX. 0.010 INCH
PLAY BETWEEN SLEEVE AND SPACER.
TO ADJUST
REMOVE CLUTCH-DRUM DRIVE GEAR AND LOOSEN DRUM MOUNTING SCREW. RELEASE 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. RE-CHECK GEAR PLAY THROUGH ONE REVOLUTION OF GEARS.

(B) CAM-SHAFT BEARING RETAINER

REQUIREMENT
WHEN MOUNTING SHAFT ASSEMBLY, BEARING SHALL SEAT PROPERLY. (NO CLEARANCE PERMISSIBLE BETWEEN BEARING AND MOUNTING SURFACE.)
TO ADJUST
ROTATE BEARING RETAINER 180 DEGREES AND POSITION BY PUSHING DOWNWARD FIRMLY.
2.04 Clutch Trip Mechanism

NOTE: REQUIREMENTS APPLY TO BOTH CLUTCH TRIP MECHANISMS, TOP PLATE AND COVER PLATE REMOVED.

(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—TRIPLEVER LOWER EXTENSION WITH CLUTCH—TRIPLEVER 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 TRIPLEVER IN DIRECTION OF CAM.)

(C) ARMATURE—BAIL SPRING

REQUIREMENT
TRIPLEVER RESET EXTENSION ON HIGH PART OF CAM. SCALE APPLIED TO LATCHING END OF ARMATURE BAIL.
MIN. 3 OZS.
MAX. 4-1/2 OZS.
TO START ARMATURE BAIL MOVING.
2.04 Clutch Trip Mechanism (Cont)

NOTE: REFER TO REQUIREMENTS IN PRECEDING PARAGRAPH.
TAPE - GUIDE PLATE REMOVED.

(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. 2-1/2 OZS.
MAX. 4-1/2 OZS.
TO START LATCHLEVER MOVING.

(B) CLUTCH - TRIPLEVER SPRING
REQUIREMENT
WITH CLUTCH JUST TRIPPED, HOLD ARMATURE AGAINST CORE, SCALE APPLIED TO TRIPLEVER LOWER EXTENSION IN LINE WITH SPRING.
MIN. 2 OZS.
MAX. 3-1/2 OZS.
TO START TRIPLEVER LOWER EXTENSION MOVING.

(C) MAGNET BRACKET
REQUIREMENT
CLEARANCE BETWEEN ARMATURE BAIL AND TOP EDGE OF TRIPLEVER LOWER EXTENSION WITH CLUTCH - TRIPLEVER 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 CLAMP SCREW LOOSENED.
2.05 Clutch Mechanism

NOTE 1: REQUIREMENTS A AND B APPLY TO BOTH CLUTCHES, TOP PLATE REMOVED.

(A) CLUTCH—TRIPLEVER UPPER EXTENSION

(1) REQUIREMENT
CLUTCH TRIPLEVER LATCHED (CLUTCH IN STOP POSITION).
CLUTCH—TRIPLEVER UPPER EXTENSION SHALL FULLY ENGAGE CLUTCH—SHOE LEVER.

TO ADJUST
POSITION UPPER EXTENSION, WITH CLUTCH—TRIPLEVER CLAMPING SCREW LOOSENED.

(2) REQUIREMENT
WITH ARMATURE IN ATTRACTION POSITION, THERE SHALL BE SOME CLEARANCE BETWEEN CLUTCH—TRIPLEVER UPPER EXTENSION AND STOP LUG WHEN CLUTCH IS ROTATED TO MAKE CLEARANCE A MINIMUM.

TO ADJUST
REFINE REQUIREMENT (1), IF NECESSARY, SO THAT CLUTCH—TRIPLEVER UPPER EXTENSION IS UNDER-OR OVERFLUSH WITH STOP LUG BY NOT MORE THAN 0.015 INCH.

(B) CLUTCH—SHOE LEVER

REQUIREMENT
GAP BETWEEN CLUTCH—SHOE LEVER AND ITS STOP LUG SHALL BE 0.055 INCH TO 0.085 INCH GREATER WHEN CLUTCH IS ENGAGED THAN WHEN CLUTCH IS DISENGAGED.

TO ADJUST
ENGAGE A WRENCH OR SCREWDRIIVER ON A SCREW ON THE ADJUSTING DISC. ROTATE DISC WITH CLAMP SCREWS LOOSENED AND CLUTCH DISENGAGED.

NOTE 2
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 ABOVE ADJUSTMENT.
(A) DISTRIBUTOR ROCKER SPRING
TO CHECK
POSITION EACH CONTACT SCREW SO ITS
CONTACT SURFACE IS ABOUT 1/32 INCH
FROM EDGE OF BLOCK.
REQUIREMENT
WITH COMPRESSION SPRINGS REMOVED,
HOLD DISTRIBUTOR BLOCK IN HORIZONTAL
POSITION, PUSH SPRING SCALE
DOWNWARD (VERTICALLY).
MIN. 3 OZS.
MAX. 4 OZS.
TO SEPARATE CONTACTS.

SEE NOTE

CONTACT SCREW
ROCKER SPRING
DISTRIBUTOR BLOCK
COMPRESSION SPRING

CONTACT ROCKER

DISTRIBUTOR CAM
SLEEVE
CAMFOLLOWER
LEVER
CAMFOLLOWER-
LEVER GUIDE
CAMFOLLOWER-
LEVER SPRING

(B) DISTRIBUTOR ROCKER-COMPRESSION SPRINGS
REQUIREMENT
WITH COMPRESSION SPRINGS INSTALLED,
AND BLOCK IN A HORIZONTAL POSITION,
APPLY SPRING SCALE AT LOWER END OF
ROCKER AND PUSH DOWNWARD.
MIN. 6-1/2 OZS.
MAX. 9-1/2 OZS.
TO SEPARATE CONTACTS.

NOTE
WITH DISTRIBUTOR BLOCK REMOVED, ADJUST
CONTACTS SO THAT THERE IS 0.070 TO 0.080
INCH BETWEEN ROCKER LEVERS AND
OIL GUARD.
2.06 Distributor Contact Mechanism (Cont)

(D) DISTRIBUTOR CONTACT GAP
REQUIREMENT
CONTACT GAP, WITH CAMFOLLOVER ON HIGH PART OF CAM:
MIN. 0.020 INCH
MAX. 0.030 INCH.
TO ADJUST
TRIP CLUTCH MANUALLY TO POSITION CAM.
TURN CONTACT SCREW TO ADJUST. CHECK ALL CONTACTS.

(C) DISTRIBUTOR BLOCK ASSEMBLY
REQUIREMENT
ROCKERS SHALL FULLY ENGAGE INSULATED PORTIONS OF RESPECTIVE CAMFOLLOWER LEVERS.
TO ADJUST
POSITION DISTRIBUTOR BLOCK WITH MOUNTING SCREWS LOOSENED.

NOTE
FOR REFINEMENT OF DISTRIBUTOR CONTACT ADJUSTMENTS, REFER TO CONTACT TIMING REQUIREMENTS.
2.07 Feed-Lever Mechanism

(A) **FEED-LEVER SET COLLAR**

**REQUIREMENT**

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 SHALL MOVE FREELY WITHOUT BINDING AT GUIDE OR COLLARS.

**NOTE**

AFTER TIGHTENING SET SCREWS, RECHECK ADJUSTMENT FOR BINDS BETWEEN FEED LEVER AND COLLARS, AND BETWEEN FEED LEVER AND GUIDE.

(B) **FEED-LEVER SPRING**

**REQUIREMENT**

WITH THE FEED-LEVER CAMFOLLOWER ROLLER ON THE LOW PART OF THE SENSING CAM
MIN. 10 OZS.
MAX. 17 OZS.
TO MOVE FEED LEVER AWAY FROM CAM.
2.08 Storing Switch Mechanism (Nontransfer Type) (Unit Without Pull-back Mechanism)

(A) STORING SWITCH CONTACTS

TO CHECK
REMOVE STORING SWITCH ASSEMBLY.
REQUIREMENT
CONTACT LEVER EXTENSIONS SHALL
BE PERPENDICULAR TO STORING BLOCK.
TO ADJUST
TURN EACH CONTACT SCREW WITH
HEX WRENCH. GAUGE BY EYE.

(B) STORING SWITCH CONTACT LEVER
EXTENSION SPRING
REQUIREMENT
MIN. 1-3/4 OZS.
MAX. 3-1/2 OZS.
TO START EACH CONTACT LEVER
EXTENSION MOVING.

(C) STORING SWITCH GUIDES
PRELIMINARY - BEFORE SWITCH ASSEMBLY IS SECURED
TO UNIT, ROTATE SLIDE ECCENTRIC TO MAKE CLEAR-
ANCE 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
AFTER CONTACT LEVER SLIDE 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 UNTIL LATCHES MOVE AWAY FROM SLIDES. HOLD CONTACT
EXTENSION LEVERS AWAY.
REQUIREMENT
MIN. 4 OZS.
MAX. 6 OZS.
TO START EACH LEVER SLIDE MOVING.
INSTRUCTIONS FOR REPLACING
STORING SWITCH ASSEMBLY

REQUIREMENT
STORING SWITCH ASSEMBLY SHALL
ALIGN WITH LATCHLEVERS SO THAT
LATCHLEVERS AND SLIDES FUNCTION
WITHOUT BINDING.

TO CHECK
MANUALLY PUSH LATCH-BAIL FOL-
LOWER AWAY FROM CAM UNTIL
LATCHES ARE FREE FROM GUIDE,
RELEASE LATCH-BAIL FOLLOWER AND
NOTE IF LATCHES FALL INTO THEIR
RESPECTIVE SLOTS.

TO ADJUST
PIVOT STORING SWITCH WITH STOR-
ING SWITCH MOUNTING SCREWS
LOOSENED. RECHECK REQUIREMENT.
2.09 Transfer-type Storing Switch Mechanism (Unit With Pull-back Mechanism)

**NOTE 1**

FOLLOWING ADJUSTMENTS (A THROUGH E) ARE TO BE MADE WITH THE CONTACT ASSEMBLIES REMOVED FROM THE UNIT. USE A TP12060 ADJUSTING TOOL TO BEND THE CONTACTS. FOR EACH ADJUSTMENT START WITH THE CONTACT PILE-UP FARTHEST FROM THE HANDLE OF THE BENDING TOOL TO AVOID DISTURRING COMPLETED ADJUSTMENTS.

(A) **BACKSTOP - NORMALLY CLOSED CONTACT REQUIREMENT**

NORMAL CLOSED CONTACT LEAVES PARALLEL TO MOUNTING PLATE AND IN LINE WITH EACH OTHER AS GAUGED BY EYE.

TO ADJUST
BEND BACKSTOP.

(B) **SPRING TENSION - NORMALLY CLOSED CONTACT REQUIREMENT**

WITH SWINGER CONTACT HELD AWAY
MIN. 2 OZS.
MAX. 6 OZS.
TO MOVE EACH NORMALLY CLOSED LEAF AWAY FROM BACKSTOP.
TO ADJUST
BEND NORMALLY CLOSED LEAF SPRING

**NOTE 2**

TO INCREASE TENSION OF NORMALLY CLOSED LEAF, IT MAY BE NECESSARY TO BEND BACKSTOP AWAY FROM LEAF, BEND LEAF, AND THEN REMAKE ADJUSTMENT (A).

(C) **SWINGER SPRING TENSION REQUIREMENT**

MIN. 35 GRAMS
MAX. 50 GRAMS
TO OPEN NORMALLY CLOSED CONTACT.
TO ADJUST
BEND SWINGER LEAF.
(D) NORMALLY OPEN CONTACT GAP
REQUIREMENT
MIN. 0.010 INCH
MAX. 0.015 INCH
CLEARANCE.
TO ADJUST
BEND NORMALLY OPEN CONTACT BACKSTOP.

(E) SPRING TENSION - NORMALLY OPEN CONTACT
REQUIREMENT
MIN. 35 GRAMS
MAX. 50 GRAMS
TO MOVE EACH NORMALLY OPEN LEAF AWAY FROM
ITS BACKSTOP.
TO ADJUST
BEND NORMALLY OPEN LEAF SPRING.

NOTE
TO INCREASE TENSION OF NORMALLY OPEN LEAF SPRING,
IT MAY BE NECESSARY TO BEND BACKSTOP AWAY FROM
LEAF, BEND LEAF, AND THEN REMAKE ADJUSTMENT (E).
INSTRUCTIONS FOR REPLACING STORING SWITCH ASSEMBLY (TRANSFER TYPE)

PLACE SWITCH ASSEMBLY ON LOWER SURFACE OF MAIN CASTING. EXERCISE CARE IN SEATING LEVER SLIDES AGAINST PUSHLEVERS AND LATCHLEVERS IN APPROPRIATE SLOT OF LEVER SLIDE GUIDE.

STORING SWITCH ASSEMBLY

REQUIREMENT
WITH TOP PLATE IN PLACE, SELECT A LTRS-BLANK-LTRS COMBINATION AND OBSERVE LATCH-AND-PUSHLEVER ACTION. STORING SWITCH SHALL ALIGN WITH LATCHLEVER SO THAT LATCHLEVERS AND SLIDES FUNCTION WITHOUT BINDING.

TO ADJUST
POSITION SWITCH ASSEMBLY WITH ITS MOUNTING SCREWS LOOSENED. RECHECK REQUIREMENT AFTER TIGHTENING SCREWS.

NOTE
A MINOR ADJUSTMENT OF THE SENSING PIN AND PUSHLEVER GUIDE MAY BE NECESSARY.
LEVER SLIDE (FINAL EXCEPT WHERE TEST SET IS AVAILABLE)

TO CHECK
STORING SWITCH ASSEMBLY INSTALLED AND SENSING SLIDES SELECTED AND LATCHED.

REQUIREMENT
MIN. 0.005 INCH
MAX. 0.020 INCH
CLEARANCE BETWEEN ALL SENSING SLIDES AND CONTACT SWINGERS.

TO ADJUST
LOosen MOUNTING BAR LOCKNUTS AND BRACKET MOUNTING SCREWS TO FRICTION TIGHT, INSERT A HEX WRENCH IN END OF CONTACT ASSEMBLY MOUNTING BAR, POSITION CONTACT ASSEMBLY BY ROTATING BAR TO PIVOT CONTACT ASSEMBLY, CHECK AT ALL SWINGERS.

LEVER SLIDE SPRING

TO CHECK
PLACE LEVER SLIDES IN UPPERMOST POSITION (BLANK SELECTED LATCHES STRIPPED), HOOK SPRING SCALE IN THE SPRING LOOP.

REQUIREMENT
MIN. 6 OZS.
MAX. 9 OZS.
TO PULL EACH SPRING TO ITS INSTALLED LENGTH.
2.10 Tape Lid Mechanism (Tape Lid Assembly Without Tape-lid Spring) (Unit Without Pull-back Mechanism)

NOTE 1
REMOVE TOP AND TAPE-GUIDE PLATES. LUBRICATE PRIOR TO ADJUSTMENT.

(1) REQUIREMENT (PRELIMINARY)

MIN. SOME
MAX. 0.010 INCH.
CLEARANCE BETWEEN PIVOT SHOULDER AND TAPE LID WHEN LID IS PRESSED AGAINST NOTCH IN TAPE-GUIDE PLATE, AND FEED-WHEEL SLOTS AND TAPE-OUT PIN HOLES ARE LINED UP.
TO ADJUST
LOOSEN TAPE-LID BRACKET MOUNTING NUTS, USING A TP 156743 GAUGE, LINE UP FEED-WHEEL GROOVE IN TAPE LID WITH SLOT IN TAPE-GUIDE PLATE. POSITION TAPE-LID BRACKET TO MEET REQUIREMENT.

(2) REQUIREMENT

TAPE-LID FRONT BEARING SURFACE (A) SHALL TOUCH TAPE-GUIDE PLATE. CLEARANCE (B) MEASURED AT FIN OF TAPE LID IN LINE WITH REAR TAPE GUIDE (SEE NOTE 3):
MIN. 0.010 INCH
MAX. 0.018 INCH.

NOTE 2
WHEN BOTH PLATES 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 FRICITION TIGHT, AND TAPE LID Pressed AGAINST TAPE-GUIDE PLATE, POSITION BRACKET. RECHECK REQUIREMENT (1).

(3) REQUIREMENT
RELEASE PLUNGER SHALL HAVE SOME ENDPLAY WHEN LID IS LATCHED AGAINST TAPE-GUIDE PLATE.
TO ADJUST
WITH ECCENTRIC MOUNTING POST LOCKNUT FRICITION TIGHT AND LID RAISED, ROTATE HIGH PART OF ECCENTRIC TOWARD TAPE-GUIDE PLATE. CLOSE LID AND ROTATE ECCENTRIC TOWARD BRACKET UNTIL LATCH JUST FALLS UNDER FLAT ON POST. RECHECK BY DEPRESSING PLUNGER WITH LID HELD DOWN. TIP OF LATCH SHOULD CLEAR POST AS PLUNGER IS OPERATED.
2.11 Tape Lid Mechanism (With Tape-lid Spring)

NOTE 1
REMOVE TOP AND TAPE-GUIDE PLATES. 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-GUIDE PLATE, 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-GUIDE PLATE. POSITION TAPE-LID BRACKET TO MEET REQUIREMENT.

(2) REQUIREMENT
WITH TAPE-LID FRONT BEARING SURFACE TOUCHING TAPE-GUIDE PLATE, CLEARANCE BETWEEN TAPE LID AND TAPE GUIDE PLATE
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-GUIDE PLATES 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-GUIDE PLATE, POSITION BEARING BRACKET. RECHECK REQUIREMENT (1).

(3) REQUIREMENT
SOME ENDPLAY IN RELEASE PLUNGER WHEN LID IS LATCHED AGAINST TAPE-GUIDE PLATE.
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-GUIDE PLATE.
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.
2.11 Tape Lid Mechanism (With Tape-lid Spring) (Cont)

TAPE-LID SPRING
TO CHECK
OPEN TAPE LID. HOLD UNIT SO TAPE-GUIDE PLATE IS HORIZONTAL. APPLY SCALE AT TOP OF LID IMMEDIATELY LEFT OF TAPE-OUT PIN HOLE. HOLD PLUNGER FULLY DEPRESSED.
REQUIREMENT
MIN. 3 OZS. *
MAX. 4-1/2 OZS. *
MIN. 1/8 OZ.
MAX. 1 OZ.
TO MOVE OPEN END OF TAPE LID AGAINST TAPE-GUIDE PLATE. *
UNITS WITH PULL-BACK MECHANISM

START-STOP LEVER DETENT BAIL

START-STOP LEVER DETENT SPRING
TO CHECK
PLACE START-STOP LEVER IN RUN POSITION.
REQUIREMENT
MIN. 14 OZS.
MAX. 22 OZS.
TO START DETENT BAIL MOVING AWAY FROM START-STOP LEVER DETENT.

TAPE-LID RELEASE-PLUNGER SPRING
TO CHECK
HOLD TAPE-GUIDE PLATE SO TOP SURFACE IS HORIZONTAL. OPEN TAPE LID.
REQUIREMENT
MIN. 28 OZS.
MAX. 48 OZS.
TO START TAPE-LID BAIL MOVING.
2.12 Tape-guide Plate

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-GUIDE PLATE. POSITION TAPE
GUIDES TO MEET REQUIREMENT.

TAPE-GUIDE PLATE

(1) REQUIREMENT
SHOULDER OF FEED-WHEEL POST SHALL NOT INTERFERE WITH TOP-PLATE OR TAPE-GUIDE
PLATE MOUNTING BRACKETS.
TO ADJUST
ROTATE FEED-WHEEL POST WITH ITS MOUNTING NUT LOOSENED.

(2) REQUIREMENT
TAPE-GUIDE PLATE SHALL REST FIRMLY AGAINST AT LEAST THREE PROJECTIONS OF THE
FRONT AND REAR PLATES.
TO ADJUST
WITH TAPE-OUT DOWNSTOP IN ITS LOWERMOST POSITION, AND TAPE-GUIDE PLATE
MOUNTING BRACKET (FRONT AND REAR) NUTS FRICION TIGHT, TRIP CLUTCH AND RO-
TATE SHAFT UNTIL SENSING PINS ARE IN THEIR UPPERMOST POSITION, WITH TAPE LID RAISED
AND START-STOP LEVER IN RUN POSITION, PRESS TAPE-GUIDE PLATE INTO POSI-
TION. GUIDE MOUNTING SCREWS INTO NOTCHES OF FRONT AND REAR PLATE'S AND
PLACE SENSING PINS ADJACENT TO LEFT EDGE OF GUIDE PLATE. PLACE TAPE-OUT PIN
INTO ITS HOLE. TIGHTEN EACH BRACKET MOUNTING NUT.

(3) REQUIREMENT
OUTER EDGES OF MOUNTING BRACKETS AND OUTER EDGES OF MOUNTING STUD
SHOULDERs SHALL ALIGN AND PROJECT EQUALLY ON FRONT AND REAR BRACKETS.
TO ADJUST
MOVE TAPE-GUIDE PLATE TOWARD FRONT OR REAR. TIGHTEN NUTS ONLY AFTER TOP
PLATE IS ADJUSTED.
2.13 Top Plate Assembly

**TOP PLATE**

(1) REQUIREMENT

- Top plate flush to 0.003 inch underflush with tape-guide plate within width of tape lid.
- To adjust
- Loosen mounting bracket nuts until brackets are friction tight. Press top plate into position. Top plate shall 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-guide plate slot shall line up.
- To adjust
- Move top plate to line up feed-wheel slot. Do not disturb requirement (2) of tape-guide plate adjustment.

(3) REQUIREMENT

- With tape lid latched, clearance between tape-lid extension covering feed-wheel slot, and top plate
- Min. 0.010 inch
- Max. 0.020 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-guide plate measured in area between tape guides (play in tape lid taken up toward tape-guide plate).
- To adjust
- Loosen two screws holding tape-lid mounting brackets together, and position tape lid. Recheck adjustments (1) and (2) of tape lid adjustment.
2.14 Tape-out Switch Assembly

(2) REQUIREMENT
MIN. 0.008 INCH
MAX. 0.015 INCH
CLEARANCE BETWEEN NORMALLY OPEN
CONTACTS.
TO ADJUST
FORM UPPER CONTACT LEAF WITH A
TP10445 SPRING BENDER.
NOTE
WHEN REPLACING SWITCH ASSEMBLY,
MAKE SURE CONTACT SWINGER IS OVER
TAPE-OUT PIN EXTENSION, AND EXTEN-
SION-BAIL SPRING CLIP IS KEPT HORI-
ZONTAL.

(A) TAPE-OUT SWITCH
TO CHECK
REMOVE COVER AND TOP PLATE. LOOSEN
TAPE-OUT SPRING ADJUSTING BRACKET,
POSITION BRACKET SO TAPE-OUT EXTEN-
SION 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
TP10445 SPRING BENDER.

(B) TAPE-OUT PIN
(1) REQUIREMENT
WHEN START-STOP LEVER IS IN FREE-WHEEL OR
STOP POSITION, TAPE-OUT PIN SHALL BE
FLUSH TO 0.010 INCH BELOW SURFACE OF
TAPE-GUIDE PLATE.
TO ADJUST
POSITION TAPE-OUT PIN DOWNSTOIP WITH
ITS MOUNTING NUT LOOSENED.

(2) REQUIREMENT
WITH START-STOP LEVER IN RUN POSITION
MIN. 0.055 INCH
CLEARANCE BETWEEN TAPE-OUT PIN EXTEN-
SION AND START-STOP LEVER BAIL EXTENSION.
TO ADJUST
POSITION EXTENSION BAIL WITH ITS MOUNT-
ING SCREW LOOSENED.

(C) TAPE-OUT SWITCH BRACKET
TO CHECK
INSERT PIECE OF UNPERFORATED TAPE UNDER
TAPE LID.
REQUIREMENT
MIN. 0.006 INCH
MAX. 0.012 INCH
FOR UNIT WITHOUT PULL-BACK MECHANISM
MIN. 0.006 INCH
MAX. 0.020 INCH
FOR UNIT WITH PULL-BACK MECHANISM
CLEARANCE BETWEEN TAPE-OUT PIN EXTENSION
AND CONTACT SWINGER PAD.
TO ADJUST
POSITION SWITCH BRACKET WITH ITS MOUNTING
SCREW LOOSENED.
2.15 Tape-out Pin and Bail Assembly

(A) TAPE-OUT BAIL YIELD SPRING
TO CHECK
PLACE START-STOP LEVER
IN RUN POSITION.
REQUIREMENT
MIN. 3 OZS.
MAX. 5 OZS.
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 OZS.
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-GUIDE PLATE.
TO ADJUST
POSITION SPRING BRACKET WITH ITS MOUNTING
SCREWS LOOSENED, RECHECK REQUIREMENT.
2.16 START-STOP Switch Assembly

START-STOP BAIL YIELD SPRING
TO CHECK
PLACE START-STOP LEVER IN RUN
POSITION.
REQUIREMENT
MIN. 4 OZS.
MAX. 6 OZS.
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 BAKELITE PAD ON SWINGER.

(2) REQUIREMENT
START-STOP AND TIGHT-TAPE SWITCH AC-
TUATORS SHALL FULLY ENGAGE BAKELITE
PAD ON SWINGER.
TO ADJUST
POSITION SWITCH BRACKET WITH ITS
MOUNTING SCREWS LOOSEened.
NOTE
IF TIGHT-TAPE SWITCH ACTUATOR RESTS
AGAINST BAKELITE PAD, HOLD ACTUATOR
AWAY.
2.17 Tight-tape Mechanism (Units Equipped With Tight-Tape, START-STOP Lever)

(A) TIGHT-TAPE, START-STOP LEVER SWITCH

(2) REQUIREMENT
WITH START-STOP LEVER IN RUN POSITION
MIN. 0.050 INCH
MAX. 0.070 INCH
CLEARANCE BETWEEN SWITCH BACKSTOP
AND BAKELITE PAD ON SWINGER WHEN
SWITCH CONTACTS ARE CLOSED.
TO ADJUST
BEND SWITCH BACKSTOP WITH
TP110445 SPRING BENDER.

NOTE
MAKE REQUIREMENT (1) ADJUSTMENT
BEFORE ASSEMBLING SWITCH TO UNIT.

(1) REQUIREMENT
MIN. 2 OZS.
MAX. 4 OZS.
TO JUST SEPARATE CONTACTS.
TO ADJUST
BEND CONTACT SWINGER WITH A TP110445
SPRING BENDER.

(C) TIGHT-TAPE BAIL YIELD SPRING
TO CHECK
OPEN TAPE LID. OPERATE START-STOP LEVER
TO FREE-WHEELING POSITION.
REQUIREMENT
MIN. 2 OZS.
MAX. 3-1/2 OZS.
TO SEPARATE BAILS.

(B) TIGHT-TAPE SLIDE ARM
TO CHECK
OPERATE START-STOP LEVER TO RUN POSITION.
REQUIREMENT
TIGHT-TAPE SWITCH CONTACTS SHALL OPEN
WHEN TIGHT-TAPE ARM IS RAISED
MIN. 0.045 INCH
MAX. 0.075 INCH
FOR UNIT WITHOUT PULL-BACK MECHANISM
MIN. 0.090 INCH
MAX. 0.120 INCH
FOR UNIT WITH PULL-BACK MECHANISM
ABOVE TAPE-GUIDE PLATE.
TO ADJUST
WITH Clamp Screw friction tight, posi-
tion bails, by means of PRy point, to
meet requirement.
2.18 Sensing Pin Assembly

(A) SENSING BAIL SPRINGS
TO CHECK
REMOVE TOP PLATE. WITH BLANK TAPE
UNDER TAPE LID, TRIP CLUTCH MAGNET
AND MANUALLY ROTATE SHAFT UNTIL
SENSING BAIL IS IN UPPERMOST POSITION.
APPLY SCALE TO BAIL BETWEEN SPRINGS.
REQUIREMENT
MIN. 1/4 OZ.
MAX. 2 OZS.
TO START BAIL MOVING.

(b) SENSING PIN SPRING
TO CHECK
TRIP SENSING CLUTCH AND ROTATE SHAFT UNTIL SENSING
PINS ARE IN THEIR UPPERMOST POSITION. HOLD PUSH-
LEVERS AWAY MANUALLY.
REQUIREMENT
MIN. 2 OZS.
MAX. 3 OZS.
FOR UNIT WITHOUT PULL-BACK MECHANISM
NO.1 TO NO.5 AND NO.7 SPRINGS
MIN. 2 OZS.
MAX. 3 OZS.
NO.6 AND NO.8 SPRINGS
MIN. 4-1/2 OZS.
MAX. 6 OZS.
FOR UNIT WITH PULL-BACK MECHANISM
TO MOVE EACH PIN FLUSH WITH TOP SURFACE OF
TAPE-GUIDE PLATE.

(C) SENSING PIN
TO CHECK
REPLACE TOP PLATE. DISENGAGE SENSING
CLUTCH.
REQUIREMENT
WITH SENSING BAIL ECCENTRIC INDENT
TOWARD RIGHT, TIP OF HIGHEST SENSING
PIN SHALL BE FLUSH TO 0.005 INCH BELOW
TOP SURFACE OF TAPE-GUIDE PLATE.
TO ADJUST
LOSEN ECCENTRIC-SHAFT LOCKNUT AND
POSITION ECCENTRIC. RECHECK REQUIRE-
MENT AFTER LOCKNUT IS TIGHTENED.
2.19 Tape Feed Mechanism

(A) FEED-WHEEL DETENT

NOTE 1

PLACE START-STOP LEVER IN STOP POSITION. IF UNIT HAS A SPRING-BIASED START-STOP LEVER, MAKE ADJUSTMENT WITH LEVER IN RUN POSITION.

TO CHECK

PLACE A L迹S PERFORATED TAPE OVER FEED WHEEL, TAKING UP PLAY IN FEED HOLES TOWARD THE RIGHT.

REQUIREMENT

SENSING PINS CENTRALLY LOCATED IN CODE HOLES.

TO ADJUST

POSITION FEED-WHEEL DETENT ECCENTRIC WITH ITS LOCK SCREW FRICITION TIGHT. HIGH PART OF ECCENTRIC SHOULD BE TOWARD RIGHT. HOLD ECCENTRIC AND TIGHTEN GUIDE POST AND LOCK SCREW. RECHECK ADJUSTMENT.

NOTE 2

HOLD FEED PAWL AWAY TO FACILITATE ADJUSTMENT.

(B) FEED-RATCHET DETENT SPRING

REQUIREMENT

WITH FEED PAWL HELD AWAY FROM RATCHET WHEEL MIN. 7 OZS.
MAX. 13 OZS.
TO MOVE DETENT ROLLER AWAY FROM FULLY DETENTED POSITION.
(B) **FEED-PAWL SPRING**

**TO CHECK**
- Place start-stop lever in stop position.
- Remove top plate. DISENGAGE CLUTCH.

**REQUIREMENT**
- MIN. 1/4 OZ.
- MAX. 1-1/2 OZS.

**TO START FEED PAWL MOVING.**

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(A) **FEED PAWL**

**TO CHECK**
- Place start-stop lever in run position.
- Remove top plate. Trip clutch, and rotate cam shaft 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

**TO ADJUST**
- Position feed lever by means of the adjusting slot with its locknut loosened.
2.20 Sensing Mechanism

(A) **PUSHER-STRIPPER-BAIL SPRING**

TO CHECK

SELECT BLANK COMBINATION, TRIP CLUTCH AND ROTATE SHAFT TO STOP POSITION.

REQUIREMENT

MIN. 7 OZS.
MAX. 11 OZS.
TO START BAIL MOVING AWAY FROM CAM.

(B) **PUSHLEVER**

REQUIREMENT


MIN. 0.020 INCH
MAX. 0.045 INCH

FOR UNIT WITHOUT PULL-BACK MECHANISM

MIN. 0.010 INCH
MAX. 0.020 INCH

FOR UNIT WITH PULL-BACK MECHANISM

TO ADJUST

WITH PUSHLEVER ECCENTRIC SHAFT LOCKNUT (FRONT PLATE) LOOSEND AND HIGH PART OF ECCENTRIC LOCATED TOWARD THE UPPER RIGHT, ROTATE ECCENTRIC TOWARD RIGHT OR LEFT.

(C) **AUXILIARY LEVER SPRING**

TO CHECK

EACH AUXILIARY LEVER ON LOW PART OF ITS CAM, SCALE APPLIED TO LEVER JUST RIGHT OF SPRING, PUSHLEVER HELD AWAY.

REQUIREMENT

MIN. 1/2 OZ.
MAX. 3 OZS.
TO START AUXILIARY LEVER MOVING.
2.21 Sensing Mechanism Springs

(A) 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 OZS.
MAX. 6 OZS.
TO START LATCH-STRIPPER BAIL MOVING.

(C) Latchlever Spring

TO CHECK
SELECT BLANK COMBINATION, TRIP SENSING CLUTCH AND ROTATE SHAFT TO STOP POSITION, LEVER SLIDES SHOULD BE IN UPPERMOST POSITION.

REQUIREMENT
MIN. 1 OZ.
MAX. 3 OZS.
TO START LATCHLEVER MOVING.
NOTE 1
TAKE CARE NOT TO DAMAGE PUSHLEVER SPRINGS IN CHECKING REQUIREMENT.

(B) Pushlever Spring

TO CHECK
SELECT LTS COMBINATION, AND LATCH SENSING CLUTCH, TRIP CLUTCH AND ROTATE SHAFT UNTIL PUSHLEVERS ARE STRIPPED.

REQUIREMENT
MIN. 1/4 OZ.
MAX. 1-1/2 OZS.
TO START PUSHLEVER MOVING.
NOTE 2
BE SURE CONTACT SLIDES DO NOT INTERFERE WITH MOVEMENT OF PUSHLEVERS.
2.22 Oil Reservoir Assembly

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 (4) LOOSENED.

WHEN CAM SLEEVE IS ROTATED, TEETH OF WICK RETAINER SHALL NOT DEFLECT UPWARD MORE THAN 1/32 INCH (GAUGE BY EYE). REFINISH ADJUSTMENT BY SLIGHTLY BENDING TEETH ON WICK COMB SPRING.
2.23 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 ADJUSTMENT.

(B) STORING SWITCH CONTACT GAP

(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
SELECT LTS COMBINATION, TRIP CLUTCH AND ROTATE SHAFT TO STOP POSITION. TRIP CLUTCH AND ROTATE SHAFT UNTIL SENSING PINS ARE IN UPPERMOST POSITION.

TO ADJUST
REFINE REQUIREMENT (1).

(3) REQUIREMENT
MIN. 0.020 INCH
MAX. 0.030 INCH
GAP BETWEEN AUXILIARY A AND B CONTACTS WHEN CONTACTS ARE FULLY OPENED.

TO ADJUST
ROTATE INDIVIDUAL CONTACT SCREW.

NOTE 2
THE ABOVE REQUIREMENTS ARE FINAL, EXCEPT IN LOCATIONS WHERE A 1A TELETYPETTER TEST SET OR A 28A OR 28B STROBOSCOPIC TEST SET IS AVAILABLE.
2.24 Cover and Panel Assembly

(A) COVER PLATE
(1) REQUIREMENT
COVER PLATE HELD FLUSH AGAINST TOP PLATE BY DETENT ACTION.
(2) REQUIREMENT
COVER PLATE 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 COVER PLATE, PLACE COVER INTO POSITION, AND POSITION TO MEET REQUIREMENTS. TIGHTEN NUTS. RECHECK AND REFINE REQUIREMENTS.

B) FRONT PANEL
NOTE
REMOVE COVER PLATE PRIOR TO INSTALLING OR REMOVING FRONT PANEL. PANEL SLIDES SHOULD ENGAGE GUIDES ON BASE SO THAT TOP EDGE OF PANEL PASSES UNDER TAPE-GUIDE PLATE.
(1) REQUIREMENT
FRONT PANEL LATCHES SECURELY AT LOWER RIGHT AND LEFT CORNERS, AND PANEL SLIDES FULLY ENGAGE BASE GUIDES.
MIN. 0.065 INCH
MAX. 0.105 INCH
CLEARANCE BETWEEN BOTTOM EDGE OF BASE RAIL AND PANEL-GUIDE FLANGE.
TO ADJUST
REMOVE TRANSMITTER FROM BASE. USE SHIMS TO OBTAIN LATERAL POSITION OF PANEL SLIDES, AND POSITION GUIDES VERTICALLY (PLACE UNUSED SHIMS UNDER HEAD OF MOUNTING SCREW). REPLACE TRANSMITTER ON BASE.

(2) REQUIREMENT
MIN. 0.015 INCH
MAX. 0.060 INCH
CLEARANCE BETWEEN PANEL TOP EDGE AND FRONT EDGE OF COVER AND TAPE-GUIDE PLATES. THE UPPER PANEL SIDES SHALL NOT TOUCH THE COVER AND TAPE-GUIDE PLATE EAVES.
TO ADJUST
WITH FRONT PANEL IN PLACE, LOOSEN PANEL-GUIDE MOUNTING SCREWS AND POSITION THE GUIDE. TO FACILITATE ADJUSTMENT, REMOVE THE FOUR VIBRATION-MOUNT NUTS AND SWING SUBBASE AWAY.
2.25 Upper Feed Wheel (Units With Bearings Mounted on Side Plates) and Upper Feed-wheel Detent (Unit With Pull-back Mechanism)

**HOLDING SCREWS**

**BEARING**

**UPPER FEED WHEEL (FOR UNITS WITH BEARINGS MOUNTED ON SIDE PLATES)**

**REQUIREMENT**

WITH DETENT DISENGAGED AND DRIVE PULLEY REMOVED, UPPER FEED WHEEL SHALL ROTATE FREELY WITHOUT INTERFERENCE.

**TO ADJUST**

LOOSEN SCREWS (2) HOLDING EACH BEARING FRICTION TIGHT. POSITION UPPER FEED-WHEEL SHAFT TO MEET REQUIREMENT. TIGHTEN SCREWS.

**BEARING**

**CLAMP SCREW**

**UPPER FEED-WHEEL DETENT**

**REQUIREMENT**

WITH REPEAT RUB-OUT TAPE IN UNIT, LOWER AND UPPER TAPE LIDS LATCHED, MANUALLY OPERATE PULL-BACK SOLENOID UNTIL TAPE IS TAUT BETWEEN UPPER AND LOWER TAPE FEED WHEELS. CODE HOLES SHALL BE CENTERED OVER RESPECTIVE SENSING PINS.

**TO ADJUST**

LOOSEN DETENT MOUNTING CLAMP SCREW FRICTION TIGHT. WITH TAPE PULL-BACK SOLENOID HELD IN ENERGIZED CONDITION, ROTATE UPPER FEED-WHEEL DETENT ON MOUNTING POST UNTIL CODE HOLES ARE CENTERED OVER SENSING PINS AND DETENT ENGAGES UPPER FEED-WHEEL RATCHET AT SECOND TOOTH BELOW CENTER OF UPPER FEED-WHEEL SHAFT.

**NOTE:** AFTER MAKING THIS ADJUSTMENT, THE REQUIREMENT MUST BE MET WHEN THE UNIT IS OPERATED UNDER POWER, CHECKING FIRST AFTER TAPE RUN-OUT AND THEN AFTER TAPE PULL-BACK. IN BOTH CASES, THE SENSING PINS SHALL BE VISIBLE THROUGH THE TAPE CODE HOLES. REFINE THE ADJUSTMENT IF NECESSARY.
2.26 Upper Feed Wheel (Units With Bearings Mounted on Top Plate) (Unit With Pull-back Mechanism)

**Upper Feed Wheel Requirement**

With detent disengaged and drive pulley removed, upper feed wheel shall rotate freely without interference.

To adjust:

*Note:* Perform adjustment with top plate, feed wheel and bearings, and run-out solenoid mechanism removed from unit. Remove by loosening two mounting screws and lifting off top plate.

Loosen holding nuts (2) holding each bearing friction tight and align bearings so feed wheel rotates freely. Recheck after nuts are tightened.

Following this adjustment, check upper feed-wheel detent.
2.27 Notcher Armature Travel and Notcher Springs (Unit With Pull-back Mechanism)

**NOTCHER ARMATURE TRAVEL**

**REQUIREMENT (EACH NOTCHER)**

1. With armature in uppermost position, notcher punch below top surface of top plate.
2. Notcher punch fully seated in die plate before armature quite reaches lowermost position.
3. Operating stroke of armature min. 0.090 inch --- max. 0.100 inch.

**TO ADJUST (EACH NOTCHER)**

A. Remove pivot pin and retaining clip. Place armature in lowermost position. Draw pencil line on armature at top of magnet, replace pivot pin. Move armature down until punch is fully seated in die plate. Pencil line should be 1/32 inch above top of magnet. If not, remove pin and adjust by rotating solenoid arm. Replace pivot pin and retaining clip.

B. With mounting screws loosened, position link bracket so that, when armature is in uppermost position, pencil line is 1/8 inch above top of magnet.

**NOTE:** With notcher magnets de-energized, place start-stop lever in free wheeling position. Load unit with tape, pull tape toward rear of unit. Tape should not be snapped on notcher points. Check and refine both notcher punch adjustments.

**NOTCHER SPRINGS (2)**

**REQUIREMENT (EACH SPRING)**

With magnet de-energized:

Min. 1 oz. --- max. 2 ozs.

To start solenoid arm moving.
2.28 Notcher Punches (Left and Right) (Unit With Pull-back Mechanism)

**NOTCHER PUNCH ALIGNMENT REQUIREMENT**

1. Operation of left notcher punch must produce a readable hole in normal sixth-level code hole position.

2. Operation of right notcher must produce readable notch at edge of tape in line with code holes.

**To adjust**

Remove notcher cover by removing its mounting screws. Loosen die-plate adjusting screws until friction tight, load unit with tape perforated with repeated LTRS code combinations. With lower feed wheel in stationary position, hold tape lid down and manually operate both notcher punches. Observe position of perforations, position die plate so that left notcher hole is on center line of code holes and there is 0.1 inch between centers of it and fifth-level code hole. Rotate die plate so that right notcher produces a notch in edge of tape approximately 0.060 inch wide. Tighten adjusting screws.
2.29 Pull-back Magnet (Unit With Pull-back Mechanism)

PULL-BACK MAGNET

REQUIRED

WITH PULL-BACK MAGNET ARMATURE HELD
AT ITS LOWERMOST POSITION
MIN. 0.060 INCH
CLEARANCE BETWEEN FEED PAWL AND
LOWER FEED-WHEEL RATCHET TEETH.

TO ADJUST

WITH MAGNET-BRACKET SCREWS FRICITION TIGHT
AND RETAINING CLIP REMOVED FROM PULL-BACK
LEVER PIVOT PIN, POSITION MAGNET BRACKET
TO MEET REQUIREMENT. REPLACE RETAINING
CLIP AND TIGHTEN SCREWS.

NOTE: TO OBTAIN A GREATER ADJUSTMENT RANGE,
PLACE PULL-BACK LEVER PIVOT PIN IN ALTERNATE
PIN HOLE.
2.30 Sensing Auxiliary Contacts (Preliminary) With Two-piece Mounting Bracket (Unit With Pull-back Mechanism)

**SENSING AUXILIARY CONTACTS (PRELIMINARY)**

**REQUIREMENTS - EACH CONTACT**

1. **WITH CONTACT OPEN, GAP**
   - **MIN. 0.010 INCH.**

2. **WITH CONTACT OPEN**
   - **MIN. 5 GRAMS — MAX. 30 GRAMS**
   - **TO START SWINGER MOVING AWAY FROM CONTACT LEVER.**

3. **WITH CONTACT CLOSED, STATIONARY CONTACT SPRING RAISED ABOVE BACKSTOP**
   - **MIN. 0.002 INCH.**

4. **WITH CONTACT CLOSED**
   - **MIN. 40 GRAMS — MAX. 60 GRAMS**
   - **TO START STATIONARY CONTACT SPRING MOVING.**

**TO ADJUST - EACH CONTACT**

A. **WITH BRACKET CLAMP SCREW LOOSEMED, POSITION BRACKET SO THAT, WHEN CONTACT LEVER IS ON LOW PART OF CAM, ACTUATING LEVER TOUCHES SWINGER AND CONTACT GAP IS APPROX. 0.015 INCH. TIGHTEN CLAMP SCREW. DO NOT DISTURB THIS ADJUSTMENT DURING REST OF PROCEDURE.**

B. **BEND STATIONARY CONTACT SPRING SO THAT FORCE OF 1 OZ. APPLIED AT END WILL GIVE CLEARANCE OF APPROX. 0.020 INCH AT END OF BACKSTOP. BEND STATIONARY CONTACT SPRING AND BACKSTOP TO OBTAIN GAP OF 0.015 — 0.025 INCH AT A AND B CONTACTS AND 0.010 — 0.025 INCH AT DISTRIBUTOR-MAGNET CONTACTS.**

C. **POSITION SHAFT SO THAT CONTACT LEVER IS ON HIGH PART OF CAM. CHECK REQUIREMENTS (2) AND (4). IF THEY ARE NOT MET, BEND STATIONARY CONTACT SPRING.**

D. **POSITION SHAFT SO THAT LEVER IS ON LOW PART OF CAM. BEND SWINGER TO MEET REQUIREMENT (2).**

**NOTE:** FOR FINAL REQUIREMENTS, SEE CONTACT TIMING REQUIREMENTS (UNIT WITH PULL-BACK MECHANISM).
2.31 Sensing Auxiliary Contacts (Preliminary) With One-piece Mounting Bracket
(UNIT WITH PULL-BACK MECHANISM)

SENSING AUXILIARY CONTACTS (PRELIMINARY) WITH ONE-PIECE MOUNTING BRACKET
NOTE 1: FOR CONTACTS WITH TWO-PIECE MOUNTING BRACKET, SEE PREVIOUS PARAGRAPH.
REQUIREMENTS EACH CONTACT
(1) WITH CONTACT OPEN, GAP
MIN. 0.010 INCH.
(2) WITH CONTACT OPEN:
MIN. 5 GRAMS --- MAX. 30 GRAMS
TO START SWINGER MOVING AWAY FROM CONTACT LEVER.
(3) WITH CONTACT CLOSED, STATIONARY CONTACT SPRING RAISED ABOVE BACKSTOP:
MIN. 0.002 INCH.
(4) WITH CONTACT CLOSED:
MIN. 40 GRAMS --- MAX. 60 GRAMS
TO START STATIONARY CONTACT SPRING MOVING.
TO ADJUST EACH CONTACT
BEND STATIONARY CONTACT SPRING SO THAT 1 OZ. APPLIED AT END OF SPRING WILL PRODUCE CLEARANCE OF APPROX. 0.020 INCH BETWEEN SPRING AND BACKSTOP. POSITION ADJUSTING SCREW SO THAT, WHEN CONTACT LEVER IS ON LOW PART OF CAM, CONTACT GAP IS 0.015 - 0.025 INCH. BEND SWINGER SO THAT IT CONTACTS ADJUSTING SCREW THROUGHOUT ROTATION OF CAM.

NOTE 2: FOR FINAL REQUIREMENTS, SEE CONTACT TIMING REQUIREMENTS
(UNIT WITH PULL-BACK MECHANISM).

NOTE 3:
RELATIVE POSITION OF DISTRIBUTOR-MAGNET CONTACT AND A AND B CONTACTS IS SAME AS SHOWN ON FIGURE FOR SENSING AUXILIARY CONTACTS (PRELIMINARY) WITH TWO-PIECE MOUNTING BRACKET.
2.32 Pull-back Run-out Clutch and Tight-tape Contact (Unit With Pull-back Mechanism)

**Pull-back Run-out Clutch**

**Requirement (Under Power)**

1. With upper feed-wheel detent disengaged:
   - Min. 3 ozs. --- Max. 5 ozs.
   - Tension measured at tape-feed pins.

2. With pull-back magnet energized or armature manually depressed:
   - Min. 3 ozs. --- Max. 6 ozs.
   - Tension measured at tape-feed pins. This requirement must be met when the ambient temperature is 60° to 80°F regardless of previous condition, running or idle.

**To Adjust**

1. (1, 2) Check that clutch felt washers are properly lubricated. Set torque adjusting nuts to meet requirements.

**Tight-tape Contact**

**Requirement**

1. Min. 40 grams --- Max. 50 grams to hold contact closed.

2. With contact open, gap:
   - Min. 0.010 inch --- Max. 0.020 inch.

**To Adjust**

1. Bend upper contact spring so that nylon button rests against top plate and a force of 2 to 3 ozs. is required to start spring moving.
2. Bend lower contact spring to meet requirement (2).
3. Recheck requirement (1), refine adjustments if necessary.
2.33 Adjustment Plate, Tape Guide, Tape-guide Plate and Tape-lid Spring
(Unit With Pull-back Mechanism)

(B) TAPE-GUIDE PLATE
REQUIREMENT
WITH TAPE IN UNIT AND AGAINST GUIDING EDGE OF DIE PLATE, APPROX 0.010 INCH CLEARANCE BETWEEN TAPE-GUIDE PLATE AND EDGE OF TAPE.
TO ADJUST
POSITION TAPE-GUIDE PLATE WITH MOUNTING SCREWS LOOSENED.

(C) ADJUSTMENT PLATE
REQUIREMENT
POSITION ADJUSTMENT PLATE SO THAT IT GUIDES TAPE CORRECTLY.
TO ADJUST
(1) WITH 1-INCH TAPE IN THE UNIT, AND LOWER EDGE OF TAPE AGAINST THE GUIDING EDGE OF THE DIE PLATE, SET THE ADJUSTMENT PLATE SO THAT THERE IS APPROX. 0.010 INCH CLEARANCE BETWEEN THE EDGE OF THE TAPE AND THE ADJUSTMENT PLATE.
(2) CHECK THAT TAPE CAN BE DRAWN FREE-LY THROUGH THE UNIT, BEING GUIDED BUT NOT BINDING BETWEEN THE DIE PLATE AND THE ADJUSTMENT PLATE.

TAPE GUIDE
REQUIREMENT
WITH TAPE GUIDE IN LATCHED POSITION, TAPE GUIDE SHALL CLEAR DIE-PLATE EXTENSIONS AND BE CENTERED ON THE UPPER FEED WHEEL.
TO ADJUST
WITH TAPE-GUIDE COVER REMOVED, LOOSEN GUIDE HINGE SCREWS FRICITION TIGHT. LATCH TAPE GUIDE IN POSITION. POSITION TAPE GUIDE TO MEET REQUIREMENT. TAPE GUIDE SHOULD ENGAGE LATCH BY APPROXIMATELY 0.020 INCH TO 0.030 INCH. WHEN UNLATCHED, TAPE GUIDE SHOULD NOT INTERFERE WITH DIE PLATE. TIGHTEN HINGE SCREWS. REPLACE TAPE-GUIDE COVER.
2.34 Lower Feed-wheel Check Pawl and Tight-tape Lever (Unit With Pull-back Mechanism)

**LOWER FEED-WHEEL CHECK PAWL**

**REQUIREMENT**

**(1)** AT END OF FEEDING OPERATION, CHECK PAWL DROPPED BEHIND A TOOTH ON RATCHET WHEEL AND

MIN. 0.003 INCH --- MAX. 0.006 INCH
CLEARANCE BETWEEN PAWL AND TOOTH. THIS REQUIREMENT SHALL BE MET WITH THE TOOTH WHICH PROVIDES THE LEAST CLEARANCE.

**(2)** WITH PULL-BACK MAGNET MANUALLY OPERATED, CHECK PAWL DISENGAGED FROM RATCHET WHEEL AND

MIN. 0.020 INCH --- MAX. 0.040 INCH
CLEARANCE BETWEEN PAWL AND OUTSIDE DIAMETER OF RATCHET WHEEL.

**TO ADJUST**

**(A)** MAKE SURE THAT FEED PAWL IS ADJUSTED PROPERLY.

**(B)** REMOVE PULL-BACK DRIVE BELT TO PREVENT BACKWARD MOVEMENT OF FEED WHEEL DURING ADJUSTMENT.

**(C)** WITH LOCKNUT LOOSENED, POSITION CHECK-PAWL ECCENTRIC TO MEET REQUIREMENT (1). KEEP CENTER OF PAWL PIVOT TO RIGHT OF ECCENTRIC CENTER OF ROTATION. TIGHTEN LOCKNUT AND RECHECK REQUIREMENT (1).

**(D)** LOOSEN CLAMP SCREW, HOLD PULL-BACK MAGNET IN OPERATED POSITION AND POSITION RELEASE LEVER TO MEET REQUIREMENT (2). TIGHTEN CLAMP SCREW, HOLD PULL-BACK MAGNET OPERATED AND SPIN RATCHET WHEEL TO CHECK THAT IT IS FREE THROUGHOUT ROTATION.

**TIGHT-TAPE LEVER**

**REQUIREMENT**

**(1)** WITH TIGHT-TAPE LEVER RESTING AGAINST TAPE GUIDE

MIN. SOME --- MAX. 0.005 INCH
BETWEEN LEVER AND TIGHT-TAPE CONTACT NYLON BUTTON.

**(2)** BAKELITE PORTION OF TIGHT-TAPE LEVER SHALL ALWAYS FALL INTO ITS SLOT IN THE UPPER TAPE GUIDE. CHECK WITH GUIDE UP AS WELL AS DOWN.

**TO ADJUST**

BEND TIGHT-TAPE LEVER.
2.35 Contact Timing Requirements (Unit Without Pull-back Mechanism)

(1) Distributor Contacts

(A) **DISTRIBUTOR CONTACTS**

**PROCEDURE** - WITH A TELETYPewriter TEST SET OR 28A STROBOSCOPIC TEST SET CONNECTED TO OUTPUT OF DISTRIBUTOR CONTACTS AND TEST SET OPERATING AT SAME SPEED AS DISTRIBUTOR REQUIREMENTS -

(1) INSERT BLANKS COMBINATION TAPE IN SENSING HEAD, TRIP DISTRIBUTOR CLUTCH, AND ORIENT SCALE OF TEST SET TO ALIGN ZERO MARK OF ITS STOP SEGMENT WITH BEGINNING OF STOP PULSE IMAGE. LENGTH OF TRACE SHALL EXTEND FROM ZERO TO 142.00 ± 4 DIVISIONS. TO ADJUST - POSITION STOP CONTACT ADJUSTING SCREW.

(2) REPLACE BLANKS COMBINATION BY AN R COMBINATION TAPE AND ORIENT TEST-SET SCALE TO ALIGN 1/2 MARK OF ITS STOP SEGMENT WITH END OF STOP PULSE IMAGE. LENGTH OF TRACE FOR #2 AND #4 CONTACTS SHALL BE EQUAL WITHIN ± 4 DIVISIONS ON EACH END OF #2 AND #4 SEGMENTS OF TEST-SET SCALE. TO ADJUST - POSITION #2 AND/OR #4 CONTACT ADJUSTING SCREW.

(3) REPLACE R TAPE WITH Y TAPE AND ORIENT TEST-SET SCALE TO ALIGN 1/2 MARK OF ITS STOP SEGMENT WITH END OF STOP PULSE IMAGE. TOTAL LENGTH OF TRACE FOR #1, #3, AND #5 CONTACTS SHALL BE EQUAL WITHIN ± 4 DIVISIONS ON EACH END OF #1, #3, AND #5 SEGMENTS OF TEST-SET SCALE.

**NOTE 2:** HOLD STOP CONTACT OPEN TO VIEW TRAILING EDGE OF #5 CONTACT IMAGE. TO ADJUST - POSITION #1, #3, AND #5 CONTACT ADJUSTING SCREWS.

(B) **DISTRIBUTOR AUXILIARY CONTACTS**

(i) REQUIREMENT - WITH TEST SET CONNECTED TO AUXILIARY CONTACT C

ALIGN END OF STOP PULSE IMAGE WITH 1/2 MARK ON STOP SEGMENT OF TEST-SET SCALE. CONTACT SHALL CLOSE AT 32 ±15 DIVISIONS IN START PULSE SEGMENT OF TEST-SET SCALE AND OPEN AT 29 ±15 DIVISIONS IN STOP PULSE SEGMENT OF TEST-SET SCALE. TO ADJUST - POSITION CONTACT ADJUSTING SCREW.

*NOTE 1:* CLUTCH ON CERTAIN UNITS TRIGGERED (ELECTRICALLY) FROM OPPOSITE SHAFT.

(ii) REQUIREMENT - WITH TEST SET CONNECTED TO AUXILIARY CONTACT B

ALIGN END OF STOP PULSE IMAGE WITH 142 MARK ON STOP SEGMENT OF TEST-SET SCALE. CONTACT SHALL CLOSE AT 25 ±15 DIVISIONS IN #1 PULSE SEGMENT OF TEST-SET SCALE AND OPEN AT 75 ±15 DIVISIONS IN #5 PULSE SEGMENT OF TEST-SET SCALE. TO ADJUST - POSITION CONTACT ADJUSTING SCREW.
2.35 Contact Timing Requirements (Unit Without Pull-back Mechanism) (Cont)

(2) Storing Switch Contacts

**B AUXILIARY CONTACTS**

PROCEDURE —-

1. With both magnets de-energized, distributor and sensing shaft clutches latched and in their stop position, turn motor off.
2. With sensing and distributor shaft driving gears held against rotation, energize both clutch trip magnets.
3. Release gears and turn motor on.
4. With test set connected to output of distributor, align end of distributor stop pulse image with 142 mark on stop segment on test set.

REQUIREMENTS —

1. With test set connected to auxiliary contact a contact shall close at 10 ±30 divisions in start pulse segment of test-set scale and open at 60 ±30 divisions in #4 pulse segment of test-set scale.
2. With test set connected to auxiliary contact b or distributor clutch trip contact, contact shall close at 30 ±30 divisions in #4 pulse segment of test-set scale and open at 70 ±30 divisions in #5 pulse segment of test-set scale.

To adjust — position respective contact adjusting screw.

**A STORING CONTACTS (#1 THROUGH #5)**

REQUIREMENTS — with test set connected to transmitter-distributor, a ltrs tape (or alternate r and y tape) placed in sensing head:

1. Align end of stop pulse image with 142 mark on stop segment of test-set scale, then connect input of test set to respective contact (#1 through #5) of storing switch.

2. With alternate r and y tape used

   The beginning and end of each trace shall occur 20 divisions or more after the beginning of the stop segment and 20 divisions or more before the end of the start segment on the test-set scale.

3. Reading of successive marking code perforations in the tape (with ltrs tape used) shall not cause the respective contact to open in excess of 1.5 milliseconds. Contacts #1 through #5 shall have no electrical break during the code pulse segments greater than 2-1/2 scale divisions at 100 WPM, 2 scale divisions at 75 WPM, 1-1/2 scale divisions at 60 WPM. No more than one break is permitted. However, breaks occurring within ±5 tolerance limits of distributor are acceptable.

To adjust — position respective contact adjusting screw.
2.36 Contact Timing Requirements (Unit With Pull-back Mechanism)

(a) DISTRIBUTOR CONTACTS

(1) To Check: Use a 28B stroboscopic test set in accordance with the instructions for strobing distributor contacts as given in the appropriate section.

(2) Tests: The requirements and adjustments for Distributor Contacts (Unit Without Pull-back Mechanism) of this section apply except that, for the unit with pull-back mechanism, all references to ±4 divisions are changed to ±3 divisions.

(b) DISTRIBUTOR AUXILIARY CONTACT

(1) To Check: Use a 28B stroboscopic test set in accordance with the instructions for strobing distributor contacts as given in the appropriate section.

(2) Tests: The requirements and adjustments for Distributor Auxiliary Contact (Unit Without Pull-back Mechanism) of this section apply except that, for the unit with pull-back mechanism the following requirements are substituted:

Close: 110 ±5 divisions in STOP segment.
Open: 31 ±8 divisions in STOP segment.

(c) TRANSMITTER SENSING CODE CONTACTS, ZERO THROUGH EIGHTH LEVEL

(1) To Check: Use a 28B stroboscopic test set in accordance with the instructions for strobing transmitter sensing code and auxiliary contacts as given in the appropriate section.

(2) Tests: The requirements and adjustments are the same as those for Storing Contacts (1 Through 5) (Unit Without Pull-back Mechanism) of this section. In addition, when testing the transmitter-distributor unit with pull-back mechanism, note the position of the latest transition (eg 85 divisions in the STOP segment) for use in checking the requirements for the transmitter sensing auxiliary contacts, sequential clutch operation.

(d) TRANSMITTER SENSING AUXILIARY CONTACTS, SIMULTANEOUS CLUTCH OPERATION.

(1) To Check: Use a 28B stroboscopic test set in accordance with instructions for strobing transmitter sensing auxiliary and code contacts as given in the appropriate section.

(2) Requirements:

(a) A Contact:

Close: 107 ±18 divisions in STOP segment.
Open: 89 ±15 divisions in TWO segment.

(b) B Contact:

Close: 2 (±15) divisions in THREE segment.
Open: 4 (±25, -15) divisions in ONE segment.

(c) Distributor Magnet Contact

Close: 85 ±10 divisions in START segment.
Remain Closed: 180 to 220 divisions.

(3) To Adjust (Each Contact): With lever clamp screw loosened, position contact lever shown in Sensing Auxiliary Contact (Preliminary), With Two-piece Mounting Bracket (Unit With Pull-back Mechanism) or Sensing Auxiliary Contacts (Preliminary) With One-piece Mounting Bracket (Unit With Pull-back Mechanism). Move lever upward to advance timing and downward to retard timing.

Note: The A contact on the two-piece mounting bracket is not adjustable.

(e) TRANSMITTER SENSING AUXILIARY CONTACTS, SEQUENTIAL CLUTCH OPERATION.

(1) To Check: Use a 28B stroboscopic test set in accordance with the instructions for strobing transmitter sensing code and auxiliary contacts as given in the appropriate section.
(2) Requirements:

(a) When reading alternate rub-out and blank characters, the mark-to-space and space-to-mark overlap transitions shall be between 25 and 85 divisions in STOP segment.

(b) With repeat rub-out tape being read, breaks in marking image shall be less than 3 divisions in transition range and no breaks outside transition range.

(c) The B contact must open in the FIVE segment. There shall be a minimum of 74 divisions between latest transition of sensing code contacts (see Transmitter Sensing Code Contacts, Zero Through Eighth Level (Unit With Pull-back Mechanism)) and closure of B contact.

(3) To Adjust:

(a) Refine preliminary adjustment in Sensing Auxiliary Contacts (Preliminary) With Two-piece Mounting Bracket (Unit With Pull-back Mechanism) or Sensing Auxiliary Contacts (Preliminary) With One-piece Mounting Bracket (Unit With Pull-back Mechanism) and contact-lever adjustment in Transmitter Sensing Auxiliary Contacts, Simultaneous Clutch Operation (Unit With Pull-back Mechanism) for distributor magnet contact to meet the requirements in (b) (1) and (b) (2).

(b) Refine the adjustments in (c) (1) for B contact to meet requirement (b) (3).

(f) GENERAL STROBING NOTES

(1) Make sure that there is overtravel in the sensing auxiliary contacts after the strobing adjustments have been made and that the contacts open with a minimum gap of 0.010 inch.

(2) To obtain overlap transitions, refine the lever slide adjustment shown in Transfer-type Storing Switch Mechanism within its 0.005- to 0.020-inch range, or refine the pushlever adjustment shown in Sensing Mechanism to within its 0.010- to 0.020-inch range. Increasing either of these gaps will increase the overlap.
B. Auxiliary Features (Unit Without Pull-back Mechanism)

Modification Kit to Provide Combination Tape-out and Tape-lid Switch

2.37 Tape-out and Tape-lid Switch Assembly

**TAPE-OUT AND TAPE-LID SWITCH**

**NOTE 1**

MAKE THIS ADJUSTMENT BEFORE ASSEMBLING SWITCH TO UNIT.

(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 ATP 110445 SPRING BENDER.

(2) REQUIREMENT

MIN. 0.008 INCH
MAX. 0.015 INCH

GAP BETWEEN NORMALLY OPEN CONTACTS.

TO ADJUST

BEND UPPER CONTACT LEAF WITH ATP 110445 SPRING BENDER.

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**NOTE 2**

TO REMOVE TAPE-OUT AND TAPE-LID SWITCH ASSEMBLY

(1) REMOVE COVER AND TOP PLATES.
(2) REMOVE SPRING ATTACHED TO BRACKET ON GUIDE POST.
(3) LOOSEN SCREW SECURING GUIDE POST TO REAR PLATE.
(4) REMOVE SCREW AND LOCK WASHER FROM FRONT END OF GUIDE POST.
(5) REMOVE ADJUSTING SCREW FROM LOWER END OF SWITCH BRACKET.
(6) GUIDE POST AND SWITCH ASSEMBLY CAN NOW BE REMOVED. TAKE CARE NOT TO DISTORT SWITCH LEAF SPRINGS.

TO REPLACE SWITCH ASSEMBLY

REVERSE DISASSEMBLY PROCEDURE.
2.38 Tape-out and Tape-lid Pin Mechanism

(B) TAPE-OUT PIN SPRING BRACKET
REQUIREMENT
MIN. 38 GRAMS
MAX. 45 GRAMS
TO DEPRESS TAPE-OUT PIN UNTIL FLUSH WITH
TAPE-GUIDE PLATE.
TO ADJUST
POSITION TAPE-OUT PIN SPRING BRACKET
WITH ITS MOUNTING SCREWS FRICCTION
TIGHT. TIGHTEN SCREWS AND RECHECK
REQUIREMENT.

(A) TAPE-OUT AND TAPE-LID SWITCH BRACKET
REQUIREMENT
MIN. 0.006 INCH
MAX. 0.020 INCH
CLEARANCE BETWEEN TAPE-OUT PIN EXTENSION
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 DOWNSTOP
REQUIREMENT
WHEN DEPRESSED TO THEIR LOWERMOST POSI-
TIONS TAPE-OUT AND TAPE-LID PINS SHALL
BE FLUSH TO 0.005 INCH BELOW SURFACE OF
TAPE-GUIDE PLATE.
TO ADJUST
POSITION RESPECTIVE DOWNSTOP POST WITH
ITS MOUNTING NUT LOOSENED.

(TOP PLATE) TAPE-LID PIN

(TAPE-OUT LID Switch Bracket)

(TAPE-LID PIN ADJUSTING SCREW)

(TAPE-LID PIN DOWNSTOP POST)

(TAPE-LID SWITCH)

(D) TAPE-LID PIN SPRING
REQUIREMENT
MIN. 1-1/2 OZS.
MAX. 3 OZS.
TO MOVE TAPE-LID PIN FLUSH WITH TOP
SURFACE OF TOP PLATE.

(E) TAPE-LID PIN
TO CHECK
REMOVE COVER PLATE.

(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 CLAMP SCREW TO FRICCTION TIGHT
AND ADJUST TAPE-LID PIN BY MEANS OF ITS
PRY POINT.
2.39 Tight-tape Switch Assembly (Units Not Equipped With START-STOP Lever)

(A) **TIGHT-TAPE SWITCH BRACKET**

**REQUIREMENT**

1. **PRELIMINARY:** WITH TIGHT-TAPE SLIDEARM ADJUSTED TO THE CENTER OF ITS ADJUSTMENT RANGE, CLEARANCE BETWEEN TIP END OF TIGHT-TAPE SLIDEARM AND BAKELITE PORTION OF CONTACT SWINGER
   
   MIN. 0.006 INCH -- MAX. 0.015 INCH.

2. **FINAL:** AFTER ADJUSTMENT OF TIGHT-TAPE SLIDEARM WITHIN ITS REQUIREMENTS OF MIN. 0.045 INCH -- MAX. 0.075 INCH,
   
   CLEARANCE BETWEEN TIP END OF TIGHT-TAPE SLIDEARM AND BAKELITE PORTION OF CONTACT SWINGER
   
   MIN. 0.006 INCH.

3. **TIGHT-TAPE SLIDEARM SHALL ENGAGE BAKELITE PORTION OF SWINGER BY FULL THICKNESS OF ARM.**

TO ADJUST -- WITH SWITCH BRACKET MOUNTING SCREWS LOOSENED, POSITION THE BRACKET.

(B) **TIGHT-TAPE LEVER SWITCH** SEE STANDARD ADJUSTMENT.

(C) **TIGHT-TAPE SLIDEARM** SEE STANDARD ADJUSTMENT.

(D) **TIGHT-TAPE BAIL YIELD SPRING** SEE STANDARD ADJUSTMENT.

**NOTE:** STANDARD ADJUSTMENT IS FOUND IN PARAGRAPH, TIGHT-TAPE START-STOP MECHANISM (FOR UNITS EQUIPPED WITH TIGHT-TAPE START-STOP LEVER).