## 28B AND 28C TRANSMITTER-DISTRIBUTOR UNITS

### REQUIREMENTS AND ADJUSTMENTS

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1. GENERAL

1.01 This section contains the requirements and adjusting procedures for the maintenance of the 28B and 28C transmitter-distributor units. The material herein, together with the section containing the general requirements for teletypewriter apparatus, provides complete adjusting information for maintenance of these units.

1.02 This section is reissued to combine the requirements and adjustments for the 28C transmitter-distributor unit with those for the 28B transmitter-distributor unit and to bring up to date the requirements and adjusting procedures for both of these units.

1.03 In this section, left or right, front or rear, and up or down 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.

1.04 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.

1.05 Where a requirement calls for the clutch to be disengaged, the clutch-shoe lever must be fully latched between its triplever 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.

1.06 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 28C units having 2-cycle cams, both halves of the cam-sleeve should be checked.

1.07 Unless otherwise indicated, the requirements and adjustments in this section are common to both the 28B and 28C transmitter-distributor units.
2. REQUIREMENTS AND ADJUSTMENTS

2.01 Cam Shafts (28B Unit)

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.

CAM-SLEEVE ENDPLOY

NOTE 2: THE ADJUSTMENT IS TO BE MADE PRIOR TO ASSEMBLY OF DRIVE GEAR TO CLUTCH DRUM.

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. RELAXE CLUTCH AND POSITION CAM SLEEVE. TIGHTEN DRUM MOUNTING SCREW AND REINSTALL DRIVE GEAR.

BALL BEARING

BEARING RETAINER

BEARING RETAINER MOUNTING SCREW

(A) CAM-SLEEVE ENDPLOY

(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.

(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.
2.02 Cam Shafts (28C Unit)

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

NOTE 2
MAKE THIS ADJUSTMENT PRIOR TO ASSEMBLY OF DRIVE GEAR TO CLUTCH DRUM.
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. RECHECK 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.
2.03 Clutch Trip Mechanism

**NOTE:** REQUIREMENTS APPLY TO BOTH CLUTCH TRIP MECHANISMS.

(A) **CLUTCH ARMATURE AIRGAP**

**REQUIREMENT**
AIRGAP 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 AIRGAP 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**
INVERT UNIT, TRIP CLUTCH MAGNET AND ROTATE SHAFT MANUALLY UNTIL TRIPLEVER RESET EXTENSION IS ON HIGH PART OF ITS CAM.
MIN. 3 OZS.
MAX. 4-1/2 OZS.
FOR 28B UNIT
MIN. 2-1/2 OZS.
MAX. 4-1/2 OZS.
FOR 28C UNIT
TO START ARMATURE BAIL MOVING.
NOTE: REQUIREMENTS APPLY TO BOTH CLUTCH TRIP MECHANISMS.

(A) CLUTCH LATCHLEVER SPRING

REQUIREMENT
CLUTCH LATCHLEVER ON LOW PART OF CLUTCH DISC
AND UNIT UPRIGHT. SCALE APPLIED TO BENT EAR OF
LATCHLEVER HORIZONTALLY,
MIN. 1/2 OZ.
MAX. 1-1/2 OZS.
TO START LATCHLEVER MOVING.

(B) CLUTCH TRIPLEVER SPRING

REQUIREMENT
WITH CLUTCH JUST TRIPPED,
HOLD ARMATURE AGAINST
CORE. SCALE APPLIED TO TRIP­
LEVER 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.
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.

(B) CLUTCH-SHOE SPRING

REQUIREMENT
CLUTCH DRUM REMOVED. SCALE APPLIED TO PRIMARY SHOE AT A TANGENT TO THE FRICION SURFACE.
MIN. 3 OZS.
MAX. 5 OZS.
TO START PRIMARY SHOE MOVING AWAY FROM SECONDARY SHOE AT POINT OF CONTACT.
NOTE I
REQUIREMENTS (A) AND (B) APPLY TO ALL CLUTCHES.

(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 ATTRACTED 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 SCREWDRIVER 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.
2.05 Distributor Contact Mechanism

NOTE 1
REMOVE OIL RESERVOIR AND DISTRIBUTOR BLOCK ASSEMBLY FOR FOLLOWING ADJUSTMENTS.

(A) : E2]{XgB}^5 Xg 7 3 N @S J J S a =XgA ^=g
X=xV ^K=N =Q \ g
3 l g =3 2 \ g Q 3 g =7 3 N @S J J S a =Xg
SHALL =Q A 3 A =g \ N g\d g( \ g) j g
\ Dg{Q =ZZg6 \ @g D=gg5 J J S a =Xg
3 Zgg6 J J S a =XgZg6 N g' = g\g6 N g
ZE =g S g0 =g0 g ZgA ^=g \ S J g S a =Xg
S ^D=Xg 7 3 N @S J J S a =Xg\SHALL
ENGAGE BY 75 PER CENT IN
SAME MANNER WHEN PLAY
IS TAKEN UP FOR A MAXIMUM.
ALL CAMFOLLOWERS SHALL
MOVE FREELY IN GUIDE SLOTS.
TO ADJUST
POSITION GUIDE WITH CAM-
FOLLOWER GUIDE MOUNTING
SCREWS LOOSENEDED.
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 DOWNWARD (VERTICALLY).
MIN. 6-1/2 OZS. — MAX. 9-1/2 OZS.
TO SEPARATE THE CONTACTS.
TO ADJUST
ROTATE CONTACT SCREWS.
IF THE REQUIREMENT CANNOT BE MET
AFTER COMPRESSION SPRINGS ARE RE-
PLACED, CHECK ROCKER-LEVER TENSION
SPRINGS.

(C) 7 3 N @S J J S a =XJ J =XgZTED A g
X=xV ^K=N =Q \ g
7 3 N @S J J S a =XgJ =XgS Q g6E A g93 X1 g1 S a
7 3 N g 2 3 J L=g3 TTLE: g3 ^Z1 g3 J S a g2LE: EQ A g
Z^Xg3 7 =g6 a gl =XgDS YgS gO J J d g
N EQ 9g1/2 S e g
MAX. 1-1/2 S e Zg\ S g\3 X J g=3 T Dg g’ =Xg
N S g EQ A g
NOTE 1
REPLACE DISTRIBUTOR BLOCK.

(B) DISTRIBUTOR CONTACT GAP

REQUIREMENT

CONTACT GAP, WITH CAMFOLLOWER 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
CAMFOLLOWER 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.
2.06 Feed Lever

(A) FEED-LEVER SET COLLAR

REQUIREMENT
MIN. 0.015 INCH
MAX. 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 SETSCREWS, RE-CHECK ADJUSTMENT FOR BINDS BETWEEN FEED LEVER AND COLLARS, AND BETWEEN FEED LEVER AND GUIDE.

(B) FEED-LEVER SPRING (PIVOTTED HEAD)

TO CHECK TRIP SENSING CLUTCH. ROTATE SHAFT UNTIL ROLLER IS OFF FEED CAM. APPLY SCALE TO FEED LEVER.

REQUIREMENT
MIN. 30 OZS.
MAX. 40 OZS.
TO START FEED ROLLER MOVING AWAY FROM CAM.

FEED-LEVER SPRING (FIXED HEAD) (2B UNIT)

REQUIREMENT
WITH SENSING CLUTCH IN STOP POSITION
MIN. 10 OZS.
MAX. 17 OZS.
TO MOVE FEED LEVER AWAY FROM ITS CAM SURFACE.
2.07 Storing Switch Mechanism

(A) STORING SWITCH CONTACT ALIGNMENT

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 SPRINGS

(1) REQUIREMENT
MIN. 1-3/4 OZS.
MAX. 3 1/2 OZS.
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
PRELIMINARY - 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
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 TO STOP POSITION. HOLD EXTENSION LEVERS AWAY.

(1) REQUIREMENT
MIN. 4 OZS.
MAX. 6 OZS.
TO START EACH CONTACT LEVER SLIDE MOVING.

(2) REQUIREMENT
MIN. 1-1/2 OZS.
MAX. 3 OZS.
TO START TAPE-OUT (6TH) LEVER SLIDE MOVING.
2.08 Sensing Mechanism Springs

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

NOTE
INSTALL OIL RESERVOIR BEFORE MAKING THE FOLLOWING 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 OZS.
MAX. 6 OZS.
TO START LATCH-STRIPPER BAIL MOVING.
2.09 Tape-lid Mechanism (28B Unit With Tape-lid Spring)

TAPE LID

NOTE I
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 FRICITION 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 FRICITION 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 SHALL CLEAR LATCH POST WHEN RELEASE BUTTON IS OPERATED. WITH TAPE LID LATCHED, TIP OF LATCH SHALL PROJECT BEYOND FLAT OF LATCH POST, AND THERE SHALL BE SOME ENDPLAY IN RELEASE BUTTON.
2.09 Tape-lid Mechanism (28B Unit 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.
TO MOVE OPEN END OF TAPE LID AGAINST TAPE-GUIDE PLATE.

TAPE-GUIDE PLATE

TAPE-LID BEARING BRACKET

RELEASE PLUNGER

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.
2.10 Tape-Lid Mechanism (28B Unit Without Tape-lid Spring)

(A) TAPE LID

NOTE: REMOVE TOP AND TAPE-GUIDE PLATE.
LUBRICATE PRIOR TO ADJUSTMENT.

(1) REQUIREMENT
WITH TAPE LID HELD AGAINST NOTCH IN TAPE-GUIDE PLATE:
A FEED-WHEEL GROOVE SHALL ALIGN WITH SLOT IN PLATE.
B HOLE IN TAPE LID FOR TAPE-OUT PIN SHALL ALIGN WITH HOLE
IN PLATE (GAUGE BY EYE).
C CLEARANCE BETWEEN PIVOT SHOULDER AND TAPE LID
SOME TO 0.010 INCH MAX.
TO ADJUST-----WITH TAPE-LID BRACKET MOUNTING NUTS (2)
LOOSENED (INSERT TIP OF TP156743 GAUGE THROUGH SLOT
AND INTO GROOVE OF LID), POSITION TAPE-LID BRACKET
RETIKTEN NUTS.

(2) REQUIREMENT
TAPE-LID FRONT BEARING SURFACE SHALL REST SQUARELY
AGAINST TAPE-GUIDE PLATE AND THERE SHALL BE 0.010 TO
0.015 INCH CLEARANCE BETWEEN THE TAPE LID AND THE TAPE-
GUIDE PLATE MEASURED AT THE TAPE-LID PIN THAT IS IN LINE
WITH THE REAR TAPE GUIDE.
TO ADJUST-----WITH TAPE-LID BEARING BRACKET MOUNTING
SCREWS FRICITION TIGHT AND TAPE LID PRESSED AGAINST TAPE-
GUIDE PLATE, POSITION BEARING BRACKET. RECHECK RE-
QUIREMENTS (1A) AND (1B).

(B) TAPE-LID RELEASE-PLUNGER SPRING
REQUIREMENT
TAPE-GUIDE PLATE HELD HORIZON-
TAL AND TAPE LID OPEN. SCALE
APPLIED IN LINE WITH PLUNGER.
MIN. 3 OZS.
MAX. 6 OZS.
TO START TAPE-LID RELEASE BAIL
MOVING.

(C) RELEASE PLUNGER
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 TAPE 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 SHALL
CLEAR POST AS PLUNGER IS OPERATED.
2.11 Tape-guide Plate (28B Unit)

**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 plate.

To adjust:
- With tape-out downstop in its lowermost position, and tape-guide plate 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-guide plate into position. Guide mounting screws into notch of front and rear plate, and place sensing pins adjacent to left edge of guide plate. 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 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.

**Start-Stop Lever**
(If not present on unit, disregard instructions pertaining to start-stop lever.)
2.12 Tape Feed Mechanism (28B Unit)

**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 shall be centrally located in code holes.

To adjust:
Position feed-wheel detent eccentric with its lock screw 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.

**Requirement**
With feed pawl held away from ratchet wheel:
- Min. 7 OZS.
- Max. 13 OZS.

To move detent roller away from fully detented position.
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2.12 Tape Feed Mechanism (28B Unit) (Cont)

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2.12 Tape Feed Mechanism (28B Unit) (Cont)

**ADJUSTING SLOT**

(B) **FEED-PAWL SPRING**

TO CHECK

REMOVE TOP PLATE, DISENGAGE CLUTCH.

REQUIREMENT

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

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 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

CLEARANCE BETWEEN FEED PAWL AND RATCHET TOOTH.

TO ADJUST

POSITION FEED LEVER BY MEANS OF THE ADJUSTING SLOT WITH ITS LOCKNUT LOOSENER.
2.13 Top Plate Assembly (28B Unit)

TOP PLATE (FIXED HEAD)

(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 Cover Plate Mechanism (28B Unit)

COVER PLATE DETENT SPRING

TO CHECK
REMOVE COVER PLATE.
REQUIREMENT
MIN. 28 OZS.
MAX. 48 OZS.
TO START PLUNGER MOVING.

COVER-PLATE DETENT SPRING

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. IF COVER PLATE DOES NOT DETENT PROPERLY [REQUIREMENT (1)], REPOSITION DETENT NUTS.
2.15 Sensing Mechanism (28B Unit)

**Sensing Pins (Pivoted and Fixed Heads)**

**Requirement**

In stop position, highest sensing pin shall 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.
2.16 Sensing Mechanism

(A) SENSING PINS (28C UNIT)

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 TWO-CYCLE OPERATION, CHECK BOTH HALVES OF CAM SLEEVE.

NOTE: HIGH PART OF ECCENTRIC IS MARKED ON FRONT END OF SHAFT BY A SMALL INDENTATION.

(c) AUXILIARY LEVER SPRING

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

REQUIREMENT
MIN. 1/2 OZ.
MAX. 3 OZ.
TO START AUXILIARY LEVER MOVING.

(B) 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 SHALL CLEAR THE TIP OF ITS PUSHLEVER BY MIN. 0.020 INCH
MAX. 0.045 INCH.

TO ADJUST
WITH PUSHLEVER ECCENTRIC-SHAFT LOCKNUT (FRONT PLATE) LOOSENED AND HIGH PART OF ECCENTRIC LOCATED TOWARD THE UPPER RIGHT, ROTATE ECCENTRIC TOWARD RIGHT OR LEFT.
SENSING BAIL SPRINGS

TO CHECK
WITH BLANK TAPE UNDER TAPE LID, TRIP CLUTCH MAGNET AND MANUALLY ROTATE SHAFT UNTIL SENSING BAIL IS IN UPPER-MOST POSITION. APPLY SCALE TO BAIL BETWEEN SPRINGS.
REQUIREMENT
MIN. 1/4 OZ.
MAX. 2 OZ.
TO START SENSING BAIL MOVING.
2.17 Storing Switch Mechanism and Oil Reservoir

NOTE: REINSTALL STORING SWITCH ASSEMBLY.

(A) STORING SWITCH ASSEMBLY REPLACEMENT

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

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

TO ADJUST
PIVOT STORING SWITCH WITH STORING SWITCH MOUNTING SCREWS LOOSENED. RECHECK REQUIREMENT.

(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 SHALL NOT DEFLECT UPWARD MORE THAN 1/32 INCH (GAUGE BY EYE). REFINE ADJUSTMENT BY SLIGHTLY BENDING TEETH ON WICK COMB SPRING.
2.18 Sensing Mechanism Springs

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

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 OZS.
TO START PUSHLEVER MOVING.
NOTE 2
BE SURE CONTACT SLIDES DO NOT INTERFERE WITH MOVEMENT OF PUSHLEVERS.
2.18 Sensing Mechanism Springs (Cont)

(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 OZS.
MAX. 5 OZS.
FOR ONE-CYCLE CLUTCH.
MIN. 1 OZ.
MAX. 2 OZS.
FOR 2-CYCLE CLUTCH (28C UNIT)
TO MOVE SENSING PIN FLUSH WITH TOP PLATE.

NOTE
WHEN CHECKING THIS SPRING ALLOW THE PUSHLEVER TO REMAIN UNDER THE TRANSFER LEVER.

(b) SENSING PIN SPRINGS (PIVOTTED 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 OZS.
MAX. 4 OZS.
TO MOVE SENSING PINS FLUSH WITH TOP PLATE.

SENSING PIN SPRINGS (FIXED HEAD) (288 UNIT)

TO CHECK
WITH UNIT IN UPRIGHT POSITION, TRIP SENSING CLUTCH AND ROTATE SENSING SHAFT UNTIL SENSING PINS ARE IN UPPER-MOST POSITION. WHILE HOLDING PUSHLEVERS AWAY FROM TRANSFER LEVER, APPLY SCALE IN LINE WITH PIN.

REQUIREMENT
MIN. 2 OZS.
MAX. 3 OZS.
TO MOVE SENSING PINS FLUSH WITH TOP PLATE.
2.19 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 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 1A TELETYPEWRITER TEST SET OR A 28A STROBOSCOPIC TEST SET IS AVAILABLE.
2.20 Pivoted Sensing Head

**TAPE DEFLECTOR**

**Requirement**
The tape deflector vertical ears shall pass freely between sensing pins 1-2 and 4-5 as pivoted sensing head is moved away from its locked position. To adjust position tape deflector with front pivot screw.

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**SENSING HEAD PIVOT SCREWS**

1. **Requirement**
   Sensing yoke shall be free of binds. To adjust position rear pivot screw for minimum endplay without binding.

2. **Requirement**
   Sensing pins shall move freely in top plate. To adjust refine requirement no. 1 adjustment.

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**TAPE-DEFLECTOR BRACKET**

**Requirement**
Arms of deflector bracket shall contact ears on tape deflector simultaneously with sensing yoke in fixed position. To adjust position deflector bracket with mounting screws loosened.
(A) FEED PAWL (PRELIMINARY)

REQUIREMENT
FEED-LEVER FOLLOWER ROLLER SHALL 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 (28C UNIT) CHECK BOTH SIDES OF FEED CAM.

(B) CHECK PAWL

(1) REQUIREMENT
CHECK PAWL SHALL 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 SHALL 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 NO. 1
NOTE 4: USE SLIGHT PRESSURE ON FEED WHEEL TO PREVENT FALSE INDICATION DUE TO OVERRIDING CHECK-PAWL SPRING.

(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 (28C UNIT) ADJUST MINIMUM SIDE OF FEED CAM ONLY.
2. 20 Pivoted Sensing Head (Cont)

(B) TAPE-RETAILING LID LATCH

(1) REQUIREMENT
MIN. 8 OZS.
MAX. 14 OZS.
TO START TAPE-RETAILING 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-RETAILING 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-RETAILING 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 UPPERMOST POSITION. LOOSEN TOP-PLATE MOUNTING SCREWS. PLACE GAUGE TP159133 ON TOP PLATE, POSITION TOP PLATE UNTIL FRONT EDGE OF GAUGE TOUCHES VERTICAL FEED PINS, AND ALL FIVE SENSING PINS TOUCH REAR EDGE OF GAUGE. RECHECK REQUIREMENT.

(2) REQUIREMENT
TAPE-RETAILING LID MUST CENTER OVER TOP PLATE (GAUGE VISUALLY).
TO ADJUST
REFINE REQUIREMENT NO. 1.
2.21 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 TOP,
CLEARANCE BETWEEN TAPE DEPRESSOR AND TOP PLATE
MIN. 0.005 INCH
MAX. 0.015 INCH.

TO ADJUST

POSITION TAPE DEPRESSOR WITH MOUNTING SCREWS LOOSENED.

**NOTE**

WHEN INSTALLED ON REPERFORATOR TRANSMITTER BASE, 0.005-TO 0.020-INCH CLEARANCE IS ACCEPTABLE AFTER PIVOTED HEAD IS PROPERLY ALIGNED WITH PUNCH BLOCK.

(3) **REQUIREMENT**

CLEARANCE BETWEEN DEPRESSOR BRACKET AND TAPE LID
MIN. 0.010 INCH
MAX. 0.050 INCH.

TO ADJUST

REFINE REQUIREMENT NO.2.
2.22 Tape Depressor and Last-character Contact Switch

**SECTION 573-127-700**

1. **(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. 1/2 OZ.
   TO JUST OPEN CONTACTS.

   **TO ADJUST**

   WITH COVER REMOVED, BEND LONG CONTACT SPRING.

2. **(B) TAPE-DEFLECTOR SPRING**

   **REQUIREMENT**
   
   MIN. 1/4 OZ.
   MAX. 1-1/4 OZS.
   TO START DEPRESSOR MOVING.

**CONTACT SPRING (SHORT)**

**CONTACT SPRING (LONG)**

**CONTACT SCREWS**

**STIFFENER**

**NOTE:** FOR FULLY ENCLOSED LAST-CHARACTER CONTACT SWITCH SEE FOLLOWING PARAGRAPH.
2.23 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.
TAPE-OUT AND TAPE-LID SWITCH

NOTE
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 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 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.
2.25 Tape-out and Tape-lid Pin Mechanism (28B Unit 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-GUIDE PLATE.
TO ADJUST
POSITION TAPE-OUT PIN SPRING BRACKET WITH ITS MOUNTING SCREWS FRICITION 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 POSITIONS, TAPE-OUT AND TAPE LID PINS SHOULD BE FLUSH TO 0.005 INCH BELOW SURFACE OF TAPE-GUIDE PLATE.
TO ADJUST
POSITION RESPECTIVE DOWNSTOP POST WITH ITS MOUNTING NUT LOOSENED.

(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,
(1) REQUIREMENT
WITH TAPE LID CLOSED:
MIN. 0.005 INCH
CLEARANCE BETWEEN SHOULDER ON PIN AND BOTTOM SURFACE OF TAPE-GUIDE PLATE.
TO ADJUST
LOosen CLAMP SCREW TO FRICITION TIGHT AND ADJUST TAPE LID PIN BY MEANS OF ITS PRY POINTS.

(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.
NOTE I
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 OZS.
MAX. 3-1/2 OZS.
TO SEPARATE BAILS.

(T) TIGHT-TAPE ARM
REQUIREMENT
TIGHT-TAPE SWITCH CONTACTS SHALL OPEN WHEN TIGHT-TAPE ARM IS RAISED:
MIN. 0.045 INCH
MAX. 0.075 INCH
ABOVE TAPE-GUIDE PLATE.
TO ADJUST
WITH CLAMP SCREW FRICITION TIGHT, POSITION BAILS, BY MEANS OF PRY POINT, TO MEET REQUIREMENT.

(A) TIGHT-TAPE SWITCH BRACKET
TO CHECK
LOOSEN CLAMP SCREW, 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 BAKELITE PAD ON SWINGER.
REQUIREMENT (FINAL)
AFTER COMPLETION OF TIGHT-TAPE ARM ADJUSTMENT
MIN. 0.006 INCH
CLEARANCE BETWEEN SWITCH ACTUATOR AND BAKELITE PAD.
TO ADJUST
WITH SWITCH BRACKET MOUNTING SCREWS FRICITION TIGHT, POSITION BRACKET. TIGHTEN SCREWS AND RECHECK REQUIREMENT.

(B) TIGHT-TAPE SWITCH
NOTE 2
MAKE THIS ADJUSTMENT BEFORE ASSEMBLING SWITCH TO UNIT.
(1) REQUIREMENT
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.

(2) REQUIREMENT
MIN. 3 OZS.
MAX. 4 OZS.
TO JUST SEPARATE CONTACTS.
TO ADJUST
BEND CONTACT SWINGER WITH A TP110445 SPRING BENDER.
2. 27 Tape-out Switch Assembly (28B Unit With START-STOP Lever)

**2. REQUIREMENT**

<table>
<thead>
<tr>
<th>MIN. 0.008 INCH</th>
<th>MAX. 0.015 INCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEARANCE BETWEEN NORMALLY OPEN CONTACTS.</td>
<td></td>
</tr>
<tr>
<td>TO ADJUST FORM UPPER CONTACT LEAF WITH A TP110445 SPRING BENDER.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**

WHEN REPLACING SWITCH ASSEMBLY, MAKE SURE CONTACT SWINGER IS OVER TAPE-OUT PIN EXTENSION, AND EXTENSION-BAIL SPRING CLIP IS KEPT HORIZONTAL.

**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 DOWNSTOP WITH ITS MOUNTING NUT LOOSENED.

**2. REQUIREMENT**

WITH START-STOP LEVER IN RUN POSITION:

<table>
<thead>
<tr>
<th>MIN. 0.055 INCH</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEARANCE BETWEEN TAPE-OUT PIN EXTENSION AND START-STOP LEVER BAIL EXTENSION.</td>
<td></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>MIN. 0.006 INCH</th>
<th>MAX. 0.020 INCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEARANCE BETWEEN TAPE-OUT PIN EXTENSION AND CONTACT SWINGER PAD.</td>
<td></td>
</tr>
</tbody>
</table>

TO ADJUST POSITION SWITCH BRACKET WITH ITS MOUNTING SCREW LOOSENED.
2.28 Tape-out Pin and Bail Assembly (28B Unit With START-STOP Lever)

(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.
2.29 START-STOP Switch Assembly (28B Unit)

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 ACTUATORS SHOULD FULLY ENGAGE BAKELITE
PAD ON SWINGER.

TO ADJUST
POSITION SWITCH BRACKET WITH ITS
MOUNTING SCREWS LOOSENED.
NOTE
IF TIGHT-TAPE SWITCH ACTUATOR RESTS
AGAINST BAKELITE PAD, HOLD ACTUATOR
AWAY.

START-STOP SLIDEARM
TIGHT-TAPE SLIDEARM
MOUNTING SCREWS
2. 30 Contact Timing Requirements for Pivoted Sensing Head (One-cycle Cam)

**DISTRIBUTOR CONTACTS - STOP AND NO. 1 THROUGH NO. 5**

(a) **TO CHECK:** Use a 1A teletypewriter test set or a 28A stroboscopic test set connected to the output of the distributor contacts with the test set operating at the same speed as the distributor.

(b) **REQUIREMENTS:**

1. Insert Blank combination tape in sensing head, trip the distributor clutch, and orient the scale of the test set to align the 0 mark of its stop segment with the beginning of the stop pulse image. Length of the trace shall extend from 0 to 142 ±4 divisions on the test-set scale. (See Figure 1.)

2. Replace Blank combination by an R perforated tape and orient the test-set scale to align the 142 mark of its stop segment with the end of the stop pulse image. Length of the trace for the No. 2 and No. 4 contacts shall be equal within ±4 divisions on each end of the No. 2 and No. 4 segments of the test-set scale. (See Figure 2.)

3. Replace the R perforated tape with Y perforated tape and orient the test-set scale to align the 142 mark of its stop segment with the end of the stop pulse segment. Length of the trace shall be equal within ±4 divisions on each end of No. 1, No. 3, and No. 5 segments of the test-set scale. (See Figure 2.)

**Note:** Hold the stop contact open to view the trailing edge of the No. 5 contact image.

(c) **TO ADJUST:**

1. To meet Requirement (2), position the No. 2 and No. 4 contact adjusting screws.

2. To meet Requirement (3), position the No. 1, No. 3, and No. 5 contact adjusting screws.

**DISTRIBUTOR AUXILIARY CONTACTS**

(a) **TO CHECK:** Connect the test set to auxiliary contact A or B.

(b) **REQUIREMENTS:**

1. Align the end of the stop pulse image with the 142 mark on the stop segment of the test-set scale.

2. The distributor auxiliary contact A shall close at 32 ±15 divisions in the start pulse segment of the test-set scale and open at 29 ±15 divisions in the stop pulse segment of the test-set scale. (See Figure 3.)

3. The distributor auxiliary contact B shall close at 25 ±15 divisions in the No. 1 pulse segment of the test-set scale and open at 75 ±15 divisions in the No. 5 pulse segment of the test-set scale. (See Figure 3.)

(c) **TO ADJUST:** Position the contact adjusting screw.

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![Figure 1 - Length of Stop Pulse](image-url)
FIGURE 2 - PULSE LENGTH REQUIREMENTS FOR DISTRIBUTOR CONTACTS NO. 1 THROUGH NO. 5

STORING SWITCH CONTACTS NO. 1 THROUGH NO. 5

(a) TO CHECK: With the test set connected to the transmitter-distributor and a LTRS tape (or alternate R and Y tape) placed in the sensing head, align the end of the stop pulse image with the 142 mark on the stop segment of the test-set scale. Then connect the input of the test set to the respective contact (No. 1 through No. 5) of the storing switch.

(b) REQUIREMENTS:

(1) With alternate R and Y tape used, the beginning and end of each trace shall occur as follows (see Figure 4):

<table>
<thead>
<tr>
<th>WPM</th>
<th>Beginning of Trace</th>
<th>End of Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Before 30 divisions in start segment</td>
<td>After 40 divisions in stop segment</td>
</tr>
<tr>
<td>75</td>
<td>Before 45 divisions in start segment</td>
<td>After 31 divisions in stop segment</td>
</tr>
<tr>
<td>60</td>
<td>Before 55 divisions in start segment</td>
<td>After 25 divisions in stop segment</td>
</tr>
</tbody>
</table>

(2) With LTRS tape used, contacts No. 1 through No. 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, or 1-1/2 scale divisions at 60 wpm. No more than one break is permitted.

(c) TO ADJUST: Position respective contact adjusting screw.

STORING SWITCH AUXILIARY TAPE-OUT, AND CLUTCH-TRIP CONTACTS

(a) TO CHECK:

(1) With both magnets de-energized and the distributor and sensing shaft clutches latched and in their stop position, turn the motor off.

(2) Hold the distributor and transmitter shaft gears against rotation and energize both clutch-trip magnets.

(3) Release the gears and turn the motor on.

(4) With the test set connected to the output of the distributor, align the end of the distributor stop pulse image with the 142 mark on the stop segment of the test set.
(b) REQUIREMENTS:

(1) With test set connected to auxiliary contact A or transmitter auxiliary contact, contact shall close at 12 ±30 divisions in start pulse segment of test-set scale and open at 70 ±30 divisions in No. 4 pulse segment of test-set scale. (See Figure 5.)

(2) With test set connected to auxiliary contact B or distributor clutch-trip contact, contact shall close at 18 ±30 divisions in No. 4 pulse segment of test-set scale and open at 46 ±30 divisions in No. 5 pulse segment of test-set scale. (See Figure 5.)

(3) With test set connected to tape-out contact or 6th pin contact of 28B unit and with no tape in the pivoted head transmitter, contact shall close at 50 ±30 divisions in No. 5 pulse segment of test-set scale and open at 65 ±30 divisions in No. 3 pulse segment of test-set scale. (See Figure 6.)

(4) With test set connected to tape-out contact or 6th pin contact of 28C unit and with no tape in the transmitter, contact shall close at 57 ±40 divisions in No. 5 pulse segment of test-set scale and open at 63 ±40 divisions in No. 3 pulse segment of test-set scale. (See Figure 5.)

(c) TO ADJUST: Position respective contact adjusting screw.
2.31 Contact Timing Requirements for Fixed Sensing Head (28B Unit)

**DISTRIBUTOR CONTACTS - STOP AND NO. 1 THROUGH NO. 5**

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 to low contact pressure.

(a) **TO CHECK:** Use a 1A teletypewriter test set or a 28A stroboscopic test set connected to the output of the distributor contacts with the test set operating at the same speed as the distributor.

(b) **REQUIREMENTS:**

(1) Insert Blank combination tape in the 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). Orient the scale of the test set to align the 0 mark of its stop segment with the beginning of the stop pulse image. Length of the trace shall extend from 0 to 142 ±4 divisions on the test-set scale. (See Figure 1.)
(2) Check the No. 2 and No. 4 contacts in accordance with the instructions given for the No. 2 and No. 4 distributor contacts of the pivoted sensing head.

(3) Check the No. 1, No. 3, and No. 5 contacts in accordance with the instructions given for the No. 1, No. 3, and No. 5 distributor contacts of the pivoted sensing head.

**STORING SWITCH CONTACTS NO. 1 THROUGH NO. 5:** Check the storing switch contacts No. 1 through No. 5 in accordance with the instructions given for the storing switch contacts No. 1 through No. 5 of the pivoted sensing head.

**STORING SWITCH AUXILIARY AND CLUTCH-TRIP CONTACTS**

(a) **TO CHECK:**

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

(2) Hold the fixed reader transmitter and the pivoted reader distributor gears against rotation. Energize both magnets.

(3) Release the gears and turn the motor on.

(4) With the test set connected to the output of the distributor, align the end of the distributor stop pulse image with the 142 mark on the stop segment of the test-set scale.

(b) **REQUIREMENTS:**

(1) With the test set connected to the auxiliary contact, the contact shall close at 12 ±30 divisions in start pulse segment of test-set scale and open at 70 ±30 divisions in No. 4 pulse segment of test-set scale. (See Figure 7.)

(2) With the distributor clutch-trip contact electrically isolated from the circuit, the clutch-trip contact shall close at 39 ±30 divisions in No. 4 pulse segment of the test-set scale and open at 67 ±30 divisions in the No. 5 pulse segment of the test-set scale. (See Figure 7.)

(c) **TO ADJUST:** Position the respective contact adjusting screws.

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**Figure 7 - Pulse Length Requirements for Storing Switch Auxiliary Contacts**

(28B Unit Fixed Head)