28 ELECTRICAL SERVICE UNITS

ADJUSTMENTS

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1. GENERAL

1.01 This section provides mechanical adjusting information for the 28 electrical service units and most of the various components that may be assembled onto it. It is reissued to include a signal bell assembly and to arrange the material in a standardized format.

Note: Remove power from units, before making adjustments.

1.02 Since this is a general revision, marginal arrows normally used to indicate changes and additions have been omitted.

2. REQUIREMENTS AND ADJUSTMENTS

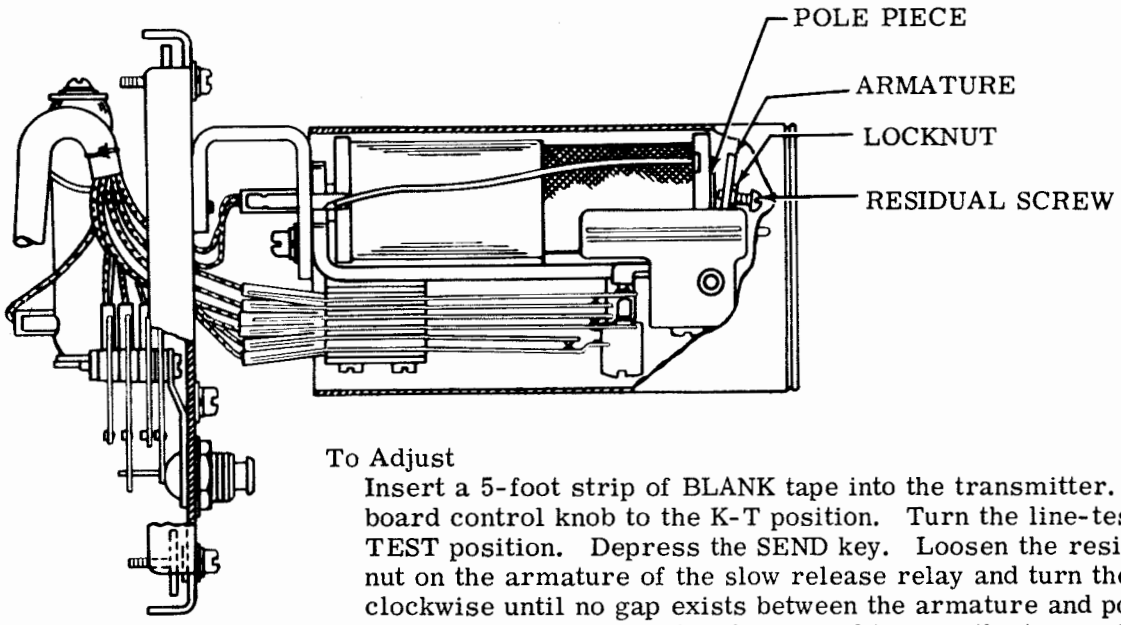
2.01 28G and 28G-1 Electrical Service Unit

SLOW RELEASE RELAY

Requirement

The relay should not de-energize while receiving a series of BLANK code combinations. The time required to stop an associated transmitter after receipt of line break signal should not exceed

Max 800 milliseconds.



To Adjust

Insert a 5-foot strip of BLANK tape into the transmitter. Turn the keyboard control knob to the K-T position. Turn the line-test key to the TEST position. Depress the SEND key. Loosen the residual screw locknut on the armature of the slow release relay and turn the screw counterclockwise until no gap exists between the armature and pole piece. Press the slow release relay test button and turn on the transmitter. With the tape running through the transmitter turn the residual screw clockwise until the slow release relay armature begins to vibrate. Then turn the residual screw counterclockwise slowly until the armature stops vibrating. Tighten the locknut. Rerun the entire 5-foot strip of tape through the transmitter, while the slow release relay test key is held depressed; the slow release relay armature must not drop out.

Insert a 5-foot strip of LETTERS tape into the transmitter. Plainly mark a row of perforations approximately three inches back from the sensing pins on the transmitter. Hold the slow release relay test button depressed, and start the transmitter. When the previously marked row of perforations reach the sensing pins, depress the line-break key and hold depressed until the transmitter stops. Mark the row of perforations immediately over the sensing pins, remove the tape from the transmitter and count the number of perforations between the two marked lines. The number of perforations between these lines should be no greater than,

(1) Eight for 100 wpm operation.
(2) Six for 75 wpm operation.
(3) Five for 60 wpm operation.

Should the number of perforations be greater than that specified above, turn the residual screw clockwise approximately 1/8 turn and repeat the above test. The number of perforations may be fewer than that specified above provided the requirement is met.

2.02 Electrical Motor-Control Mechanism (if Equipped)

(A) STOP ARMATURE SPRING

Requirement
Stop armature latched on start armature. Stop armature spring unhooked.
Min 4-1/2 oz---Max 6 oz
to pull spring to installed length.

(B) INTERMEDIATE LEVER SPRING

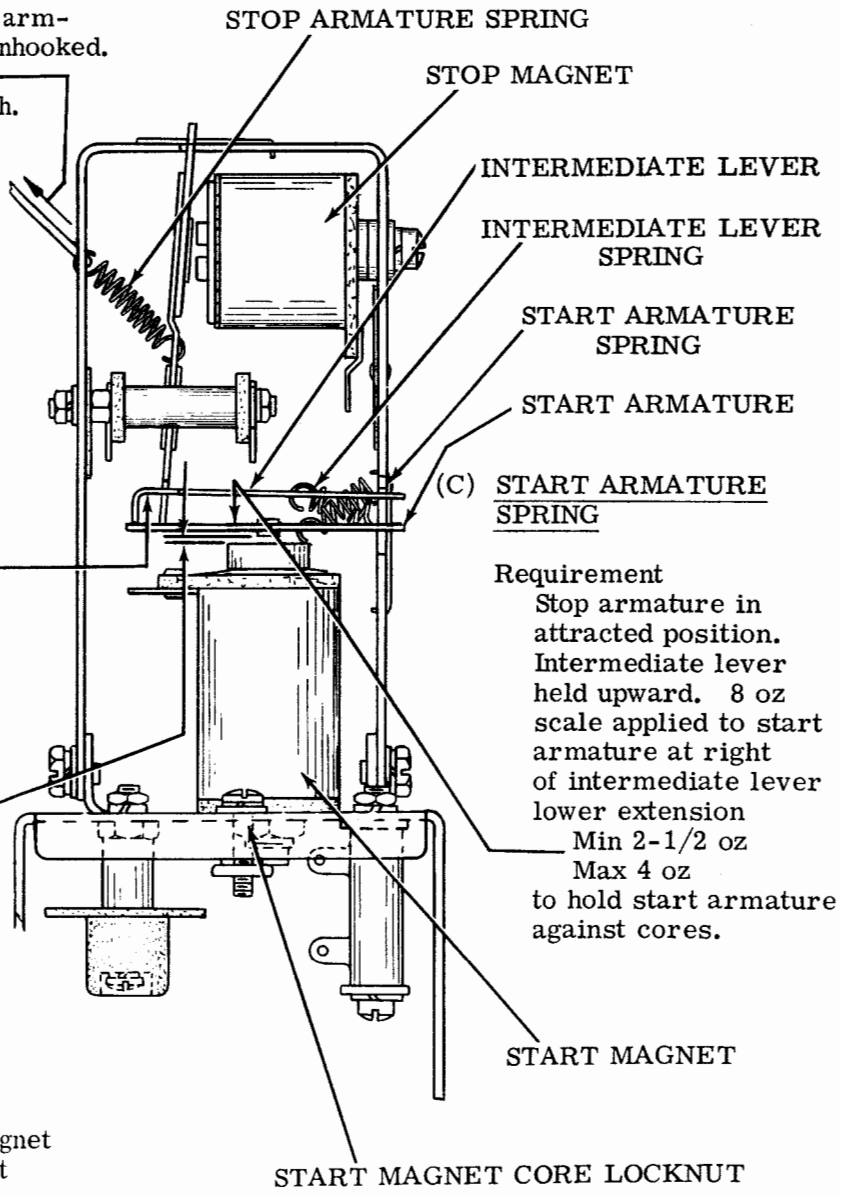
Requirement
With the stop and start armatures held against their cores, apply a gram scale to the under side of the intermediate lever just to the right of its downward extension and push upward.
Min 10 grams
Max 20 grams
to start the lever moving upward.

(D) START MAGNET CORE

Requirement
Stop armature in unattracted position. Clearance between the start magnet core and anti-freeze rivet on the start armature

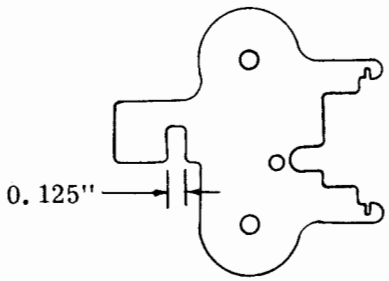
Armature	TP151409	TP152849
Min	0.003 inch	0.010 inch
Max	0.010 inch	0.015 inch

To Adjust
Advance or retard the start magnet cores with screwdriver (locknut loosened).

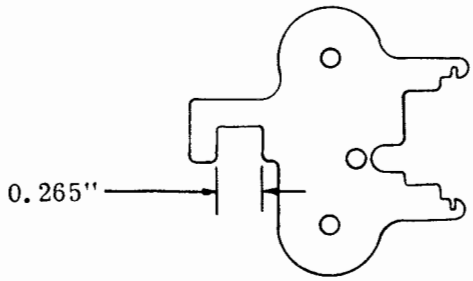


(C) START ARMATURE SPRING

Requirement
Stop armature in attracted position. Intermediate lever held upward. 8 oz scale applied to start armature at right of intermediate lever lower extension
Min 2-1/2 oz
Max 4 oz
to hold start armature against cores.



TP151409 ARMATURE



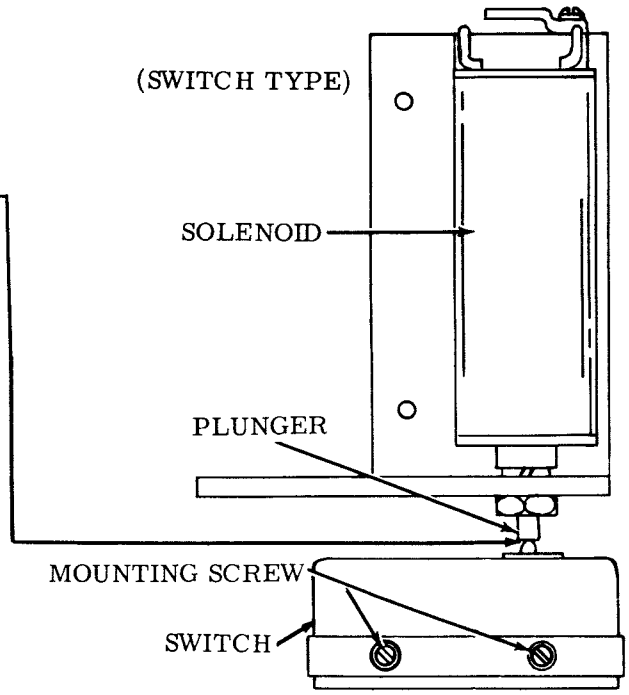
TP152849 ARMATURE

2.03 Relay Motor-Control Mechanism (if Equipped)

SWITCH POSITION (IF UNIT IS SO EQUIPPED)

Requirement
When the solenoid plunger is depressed slowly, the switch should operate when the plunger is within
Max 0.005 inch
from the end of its travel (gauge by eye). Check by the audible click or by test lamp.

To Adjust
Loosen the switch mounting screws. Hold the plunger downward and move the switch toward the plunger until it operates. Tighten the screws.



EARLIER DESIGN
(CONTACT PILE-UP TYPE)

(A) MIDDLE CONTACT SPRING

Requirement
With solenoid plunger unoperated
Min 2 oz---Max 3 oz
to break contact with inner contact.

To Adjust
Form middle contact spring with suitable spring bender.

(B) OUTER CONTACT SPRING

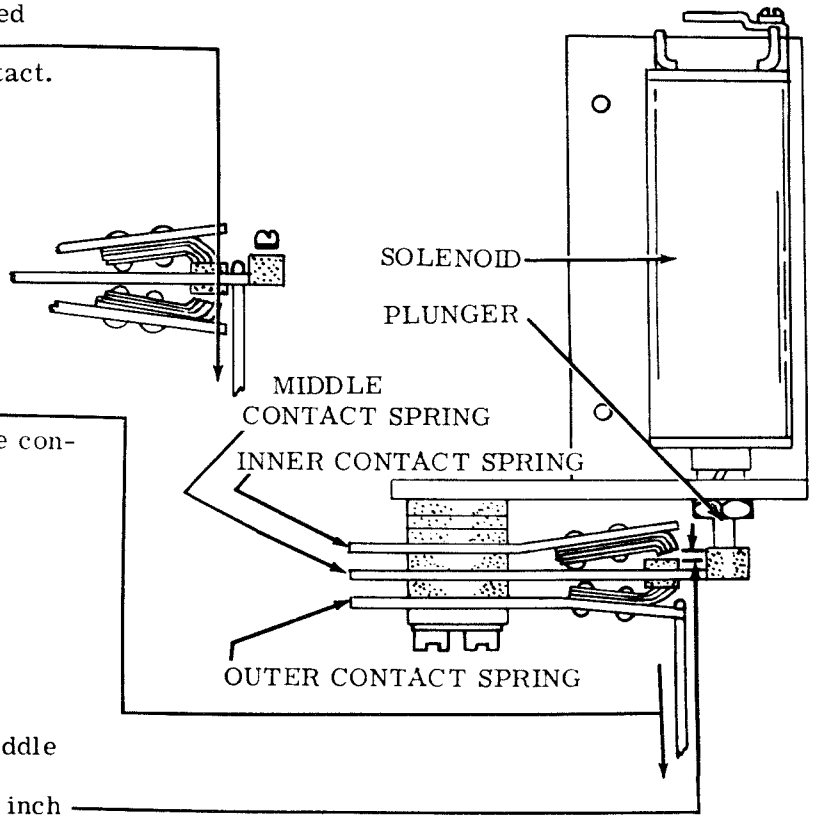
Requirement
Hold solenoid plunger operated.
Min 12 oz---Max 16 oz
to break contact with the middle contact spring.

To Adjust
Form outer contact spring with suitable spring bender.

(C) INNER CONTACT SPRING GAP

Requirement
Hold solenoid plunger operated.
Clearance between inner and middle contact spring contact surface
Min 0.025 inch---Max 0.030 inch

To Adjust
Form inner contact spring with suitable spring bender.



2.04 Signal Bell

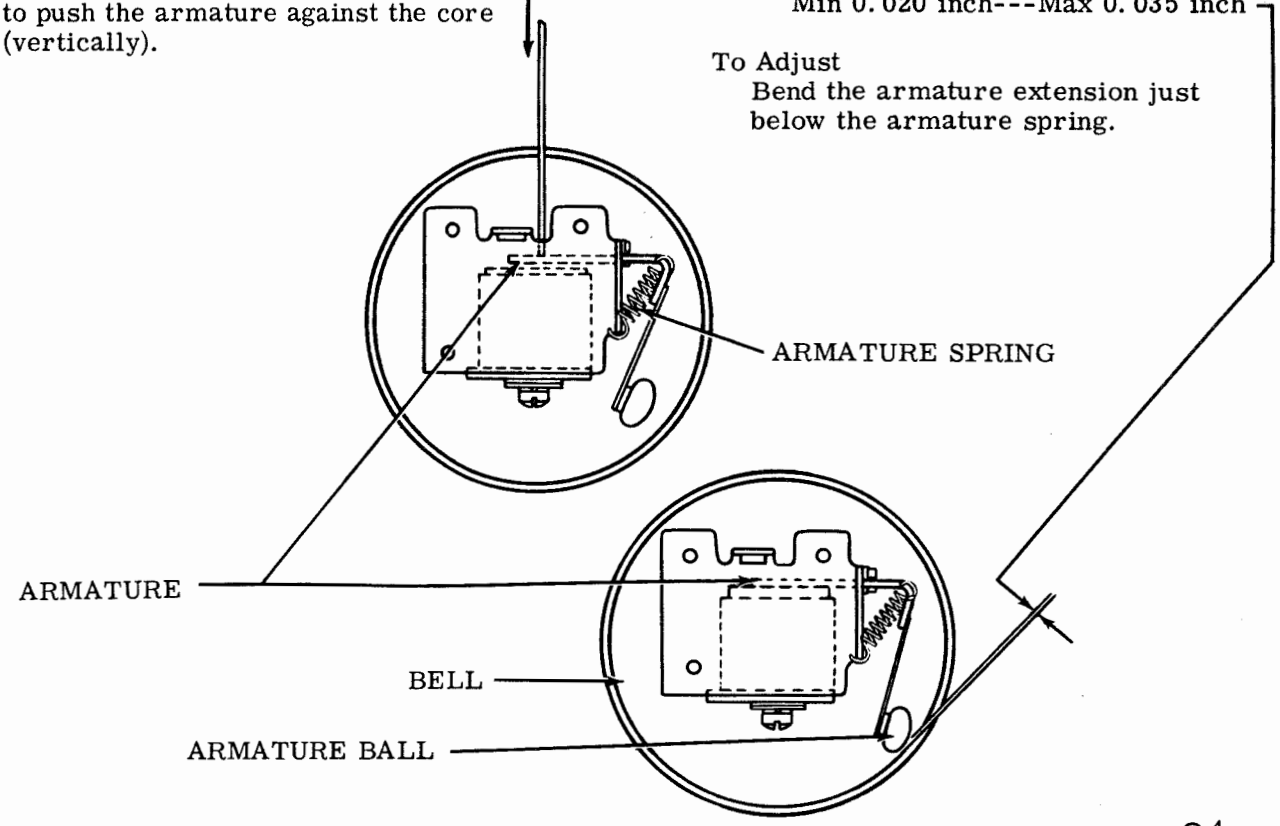
(A) ARMATURE SPRING TENSION

Requirement
Min 1/2 oz---Max 1 oz
to push the armature against the core (vertically).

(B) REMOTE SIGNAL BELL

Requirement
Armature held against the magnet core. Clearance between the armature ball and the bell
Min 0.020 inch---Max 0.035 inch

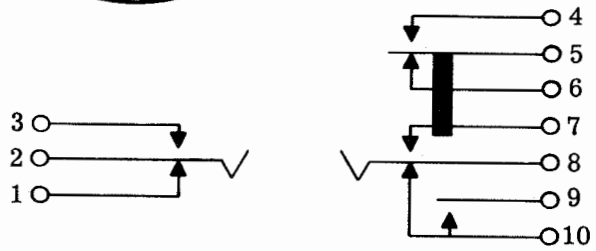
To Adjust
Bend the armature extension just below the armature spring.

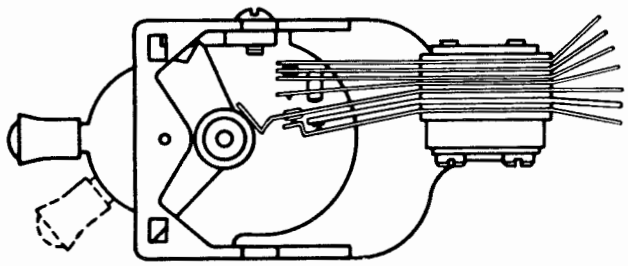


2.05 Line Test Key Assembly (if Equipped)

LINE TEST KEY

Note: This key is carefully adjusted at the factory and should not need readjusting unless it has been disassembled or mutilated.





Requirement
When knob is moved to downward position contacts 9-10 should close before contacts 8-10 and 5-6 open.

To Adjust (if necessary)
Form contact leaf springs with a suitable spring bender to meet requirements.

2.06 28 LB Electrical Service Unit

(A) Requirement for circuit assurance detector: The circuit assurance detector should accept incoming spacing signals from a receive set without setting off an alarm. If the spacing signals fall within the limits of 32.6 to 73.0 ms in length, and are received at least once each 500 ms, the alarm does not operate. The alarm contacts in the dry-reed relay pack (a part of the circuit assurance detector) close to initiate an alarm if the signal to the send set does not comply.

(B) To adjust: The timers on the circuit assurance card are adjusted with off-line signals by using the TP146439 adapter. The character T or V (32.6 ms marking pulse and 73.0 ms marking pulse respectively) is sent from the 28 LA or 28 LB transmitter distributor to the MLR relay. Using the TP146439 adapter, a 32.6 ms spacing pulse, and a 73.0 ms spacing pulse are taken from the normally closed contacts of the MLR relay and fed into the card. The operating point of the lower limit timer is set by using the 32.6 ms spacing pulse and the operating point of the upper limit timer is set by using the 73.0 ms spacing pulse.

(C) Preliminary preparation:

(1) Prepare four test tapes as follows:

(a) Three feet punched with BLANKS only.

(b) Three feet punched with T only.

(c) Three feet punched with M only.

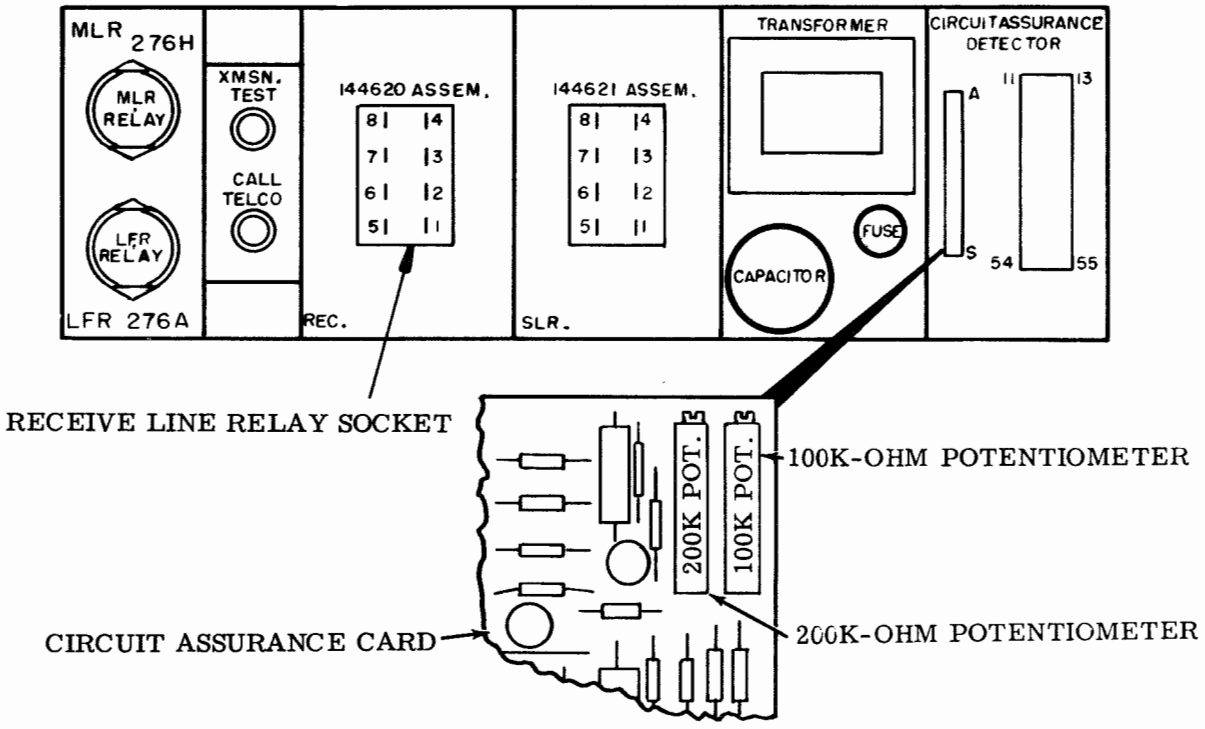
(d) Three feet punched with V only.

(2) Lower the message processing panel of the send set.

(a) Block relay CFR operated.

(b) Block relay PBRB operated.

(c) Set the timer disable switch to its NORMAL position.



(3) Lower the alarm panel of the send set.

(a) Block relay TCFR in the unoperated position.

(4) Remove the following from their sockets in the electrical service unit.

(a) Relay REC.

(b) Relay LFR.

(c) Relay MLR.

(d) Wave shaping assembly (TP-146652).

(5) Plug relay MLR into the socket provided in the adapter.

(6) Plug the adapter, with the MLR relay, into the MLR socket of the electrical service unit.

(7) Plug the adapter test plug into the REC socket of the electrical service unit.

(D) Upper limit timer adjustment (73 ms):

(1) Set the switch on the adapter to its ADJUST position.

(2) Place the beginning of the V test tape in the reading head of the TD.

(3) Set the TD STOP-RUN lever in the STOP position.

(4) Press the RESET key on the key and lamp assembly to clear all alarms.

(5) Set the TRANSMITTER selector switch on the key and lamp assembly to its NORMAL position.

(6) Start the test tape through the TD by operating the STOP-RUN lever to the RUN position.

(7) With the TD reading the V test tape, rotate the adjusting screw of the 200K potentiometer (rear potentiometer) on the card counterclockwise until CONNECTION LOST alarm operates. Then rotate the adjusting screw clockwise until the CONNECTION LOST alarm fails to operate.

Note: Every time the alarm operates, the circuit must be reset by pressing the RESET key with the TD lever in the STOP position.

(8) Very slowly rotate the adjusting screw counterclockwise until the CONNECTION LOST alarm just operates as V test tape is read by TD.

(E) Lower limit timer adjustment (32. 6 ms):

(1) Set the switch on the adapter to ADJUST position.

(2) Place the beginning of the T test tape in the reading head of the TD.

(3) Set the TD STOP-RUN lever in the STOP position.

(4) Press the RESET key on the key and lamp assembly to clear all alarms.

(5) Set the TRANSMITTER selector switch on the key and lamp assembly to its NORMAL position.

(6) Start the test tape through the TD by setting the STOP-RUN lever on RUN.

(7) With the TD reading the T test tape, rotate the adjusting screw of the 100K potentiometer (forward potentiometer) on the card clockwise until the CONNECTION LOST alarm operates. Then rotate the screw counterclockwise until the alarm fails to operate.

Note: Every time the alarm operates, the circuit must be reset by pressing the RESET key with the TD lever in the STOP position.

(8) Very slowly rotate the adjusting screw clockwise until the CONNECTION LOST alarm just operates as T test tape is read by TD.

(F) Final tests:

(1) Set the adapter switch in its TEST position. Press the RESET key on the key and lamp assembly with the TD lever in the STOP position to clear any alarms.

(2) Place the beginning of the BLANK test tape in the reading head of the TD and start the TD reading. CONNECTION LOST alarm should operate. If not, readjust the upper limit timer. To clear an alarm condition depress the RESET key on the key and lamp assembly with the TD lever in the STOP position

(3) Replace the BLANK test tape with the T test tape and start the TD. The CONNECTION LOST alarm should fail to operate. If the alarm operates, readjust the upper limit timer as described in (D).

(4) Replace the T test tape with the M test tape and start the TD. The CONNECTION LOST alarm should fail to operate. If the alarm operates, readjust the lower limit timer as described in (E).

(5) Replace the M test tape with the V test tape and start the TD. The CONNECTION LOST alarm should operate. If the alarm fails to operate, readjust the lower limit timer as described in (E). Clear the alarm as previously described.

(6) Restore the equipment to normal by reversing the order of (C), Preliminary preparation. The timer disable switch should be in NORMAL position.