SWITCHES
PLUNGER TYPE
PRIMARY AND SECONDARY LINE SWITCHES AND OUT-TRUNK SWITCHES
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers plunger-type primary and secondary line switches and out-trunk switches.

1.02 This section is reissued to refer to the section covering cleaning of bank contacts and to bring the section up to date. Since the reissue covers a general revision, the arrows ordinarily used to indicate changes have been omitted.

1.03 Reference shall be made to the section covering general requirements and definitions for additional information necessary for the proper application of the requirements listed herein.

1.04 *Asterisk (*):* Requirements are marked with an asterisk when to check for them would necessitate dismantling or dismounting of apparatus, or would affect the adjustment involved or other adjustments. No check need be made for these requirements unless the apparatus or part is made accessible for other reasons or its performance indicates that such a check is advisable.

1.05 *Operate:* The B relay (pulldown magnet) is said to operate if, when current is connected to its winding, the plunger enters the bank, closing the bank contacts, and the normally closed contacts of the BCO spring assembly open and the normally open contacts close.

1.06 *Nonoperate:* The B relay (pulldown magnet) is said to nonoperate if, when current is connected to its winding, the plunger armature does not leave its backstop.

1.07 The relays shall meet the requirements specified in the section covering step-by-step relays – AECo horizontal type.

1.08 *Numbering of Springs:* All relay contact springs are numbered from the mounting end of the pile-up outward unless otherwise specified on the circuit requirement table.

1.09 To check requirements 2.21 and 2.22, it is necessary to remove the switch from the shelf. To do this, proceed as covered in 3.002. After checking the requirements and adjusting the switch, if necessary, remount the switch as covered in 3.003.

2. REQUIREMENTS

2.01 *Cleaning*

(a) Relay contacts shall be cleaned when necessary in accordance with the section covering cleaning and reconditioning relay contacts.

(b) The tip and ring bank contacts (lower contacts) shall be cleaned and treated when necessary in accordance with the section covering cleaning of bank contacts. Customers and operators reports of service conditions and other service indices indicate the need for cleaning and treating the contacts. A contact noise survey can be made as described in the tests and inspections section covering contact noise measurements with 30A level distribution register to check whether the bank contacts are causing noise.

(c) Other parts shall be cleaned when necessary in accordance with approved procedures.

2.02 *Form of Bank Contact Springs:* The shape of the bank contact springs shall be approximately uniform throughout the bank and shall be such that as the plunger enters the bank, there is a perceptible flexing of the bank contact springs after they make contact with their associated bank contacts.

Gauge by eye.

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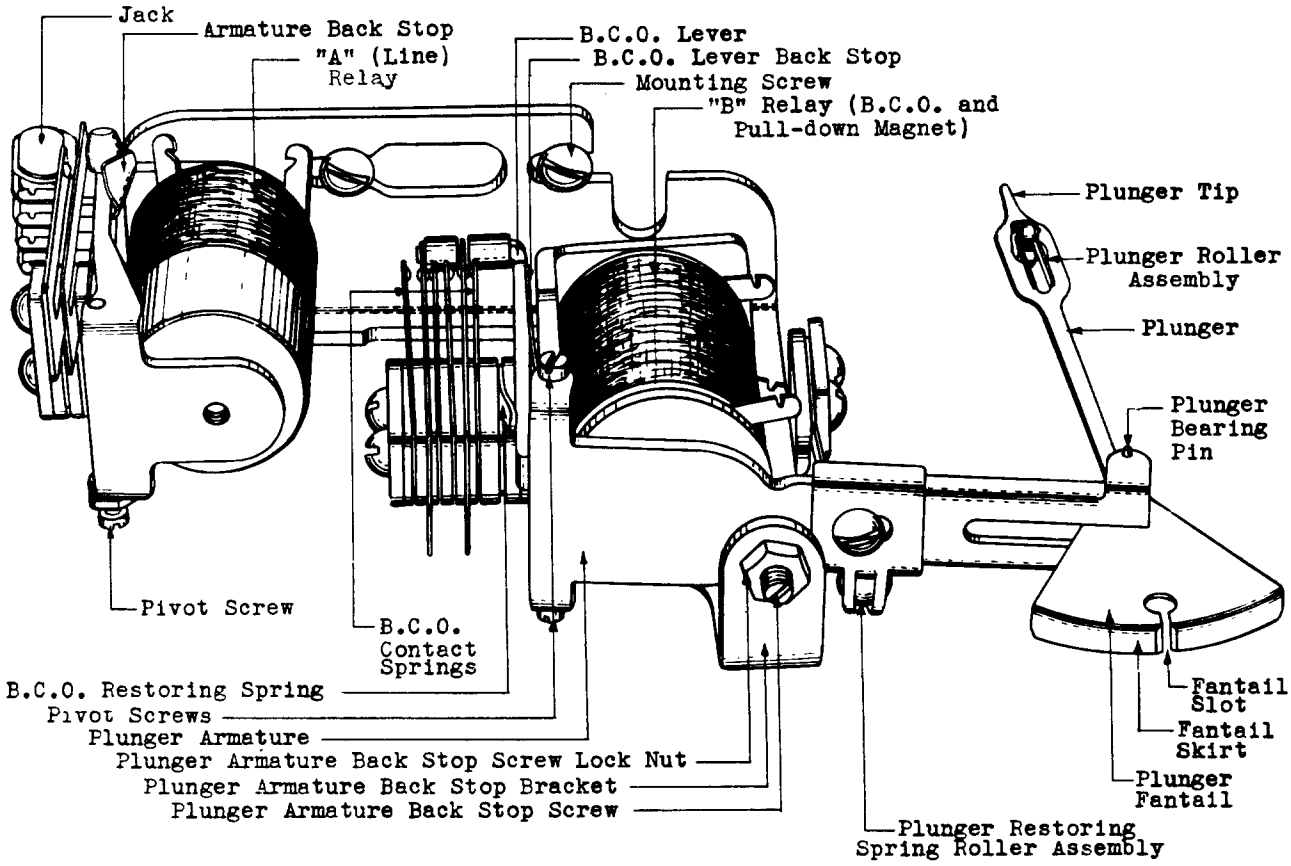

Fig. 1 — Plunger-Type Primary Line Switch

2.03 ***Contact Spring and Bank Contact Clearance***

(a) Fig. 2(B) – There shall be a clearance between the inside bank contact springs and the associated bank contacts of

Min 0.020 inch

Gauge by eye.

(b) Fig. 2(A) – There shall be a clearance between the outside bank contact springs and the associated bank contacts of

Min 0.020 inch
Max 0.070 inch

Gauge by eye.

2.04 ***Plunger Roller Movement:*** Fig. 3(A)–The plunger rollers shall turn freely on their bearing pins.

Gauge by feel.

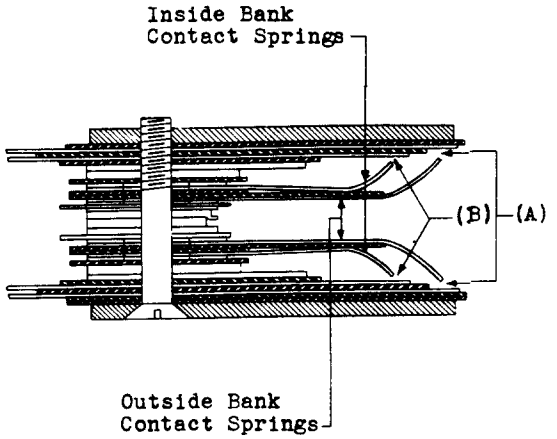

Fig. 2 — Cross Section of Bank

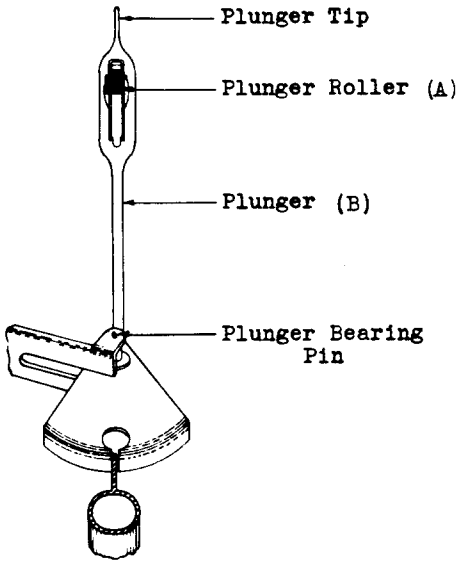

Fig. 3 — Switch Plunger

2.05 ***Straightness of Plunger:*** Fig. 3(B) — The plunger shall be approximately straight from the plunger bearing pin to the tip.
Gauge by eye.

2.06 ***Plunger Oscillation:*** Fig. 4(B) — There shall be no observable change in the depth of engagement of the plunger guide shaft and the plunger fantail slot as the plunger oscillates under control of the guide shaft.
Gauge by eye.

2.07 ***Fantail Slot and Plunger Guide Shaft Engagement:*** Fig. 4 (C)

(a) The sides of the slot in the plunger fantail shall not bind on the edge of the plunger guide shaft.
Gauge by feel.

(b) ***Clockspring Steel Plungers (earlier type):*** The slot in the plunger fantail shall engage the plunger guide shaft to a depth of approximately 0.050 inch measured at the top of the fantail. This is about one-half the depth of the slot.
Gauge by eye.

(c) ***Phosphor Bronze Plungers (present type):*** The solt in the plunger fantail shall engage the plunger guide shaft to a depth of approximately 0.070 inch measured at the bottom of the fantail skirt.
Gauge by eye.

2.08 ***Plunger Tip and Bank Comb Tip Clearance:*** Fig. 4(A)

(a) With the plunger armature against the backstop screw and the plunger oscillating, the tip of the plunger shall clear the bank comb teeth.

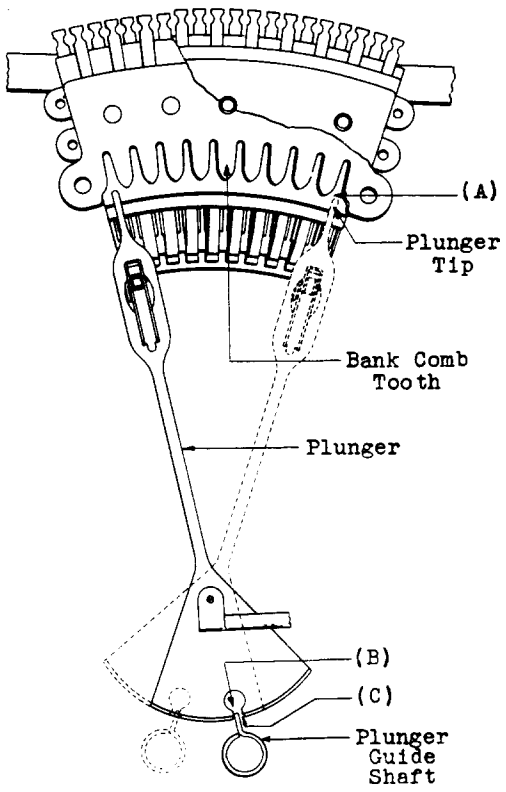

Fig. 4 — Relation of Plunger to Guide Shaft and Bank Comb

Gauge by eye and feel.

(b) With a 0.002-inch thickness gauge inserted between the plunger armature and backstop screw, the tip of the plunger shall touch the adjacent bank comb teeth, when the plunger is manually moved sideways in front of the second and ninth bank comb slots.
Use the KS-6909 gauge.

2.09 ***Angle of Switch With Shelf:*** The lower surface of the switch frame shall form approximate right angles with both the front and side surfaces of the shelf on which it is mounted.
Gauge by eye.

2.10 ***Fantail Spacing:*** The spaces between adjacent plunger fantails of switches mounted on the same shelf shall be approximately equal and the plunger bearing pins of adjacent switches shall not touch each other.
Gauge by eye.

2.11 ***Clearance Between Plunger Tip and Bank Comb Stop:*** Fig. 5(A)—There shall be some clearance between the plunger tip and the bank comb stop (end of bank) when the plunger fantail slot is engaged with the plunger guide shaft op-

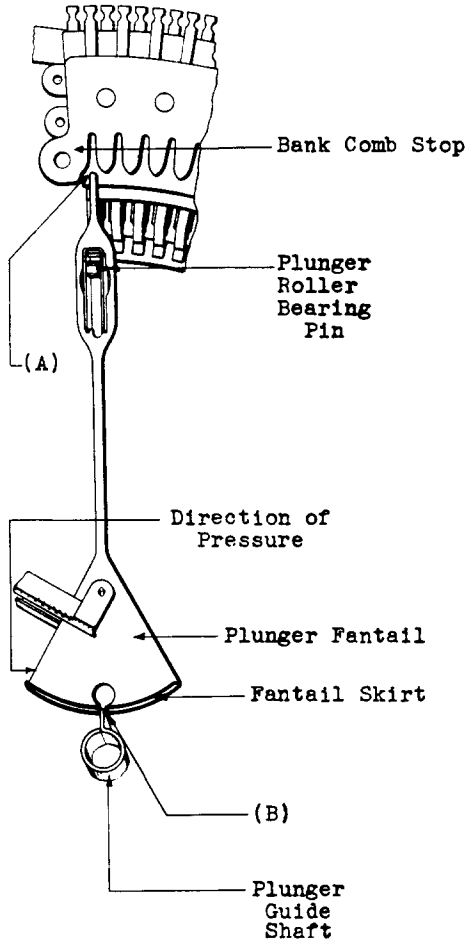

Fig. 5 — Clearance Between Plunger Tip and Bank Comb Stop

posite No. 1 trunk. This requirement shall also be met with the plunger guide shaft opposite No. 10 trunk.

Gauge by feel.

2.12 ***Re-engagement of Plunger With Plunger Guide Shaft:*** Fig. 5(B) and 6(A) — With the plunger guide shaft opposite the No. 1 trunk, the slot in the plunger fantail shall re-engage the plunger guide shaft from the No. 1 trunk when the tip of the plunger is held lightly against the bank comb stop (end of bank) by a small amount of pressure applied to the side of the fantail. This requirement shall also be met with the guide shaft opposite the No. 10 trunk and the slot in the plunger fantail shall also re-engage the plunger guide shaft from the No. 10 trunk.
Gauge by eye and feel.

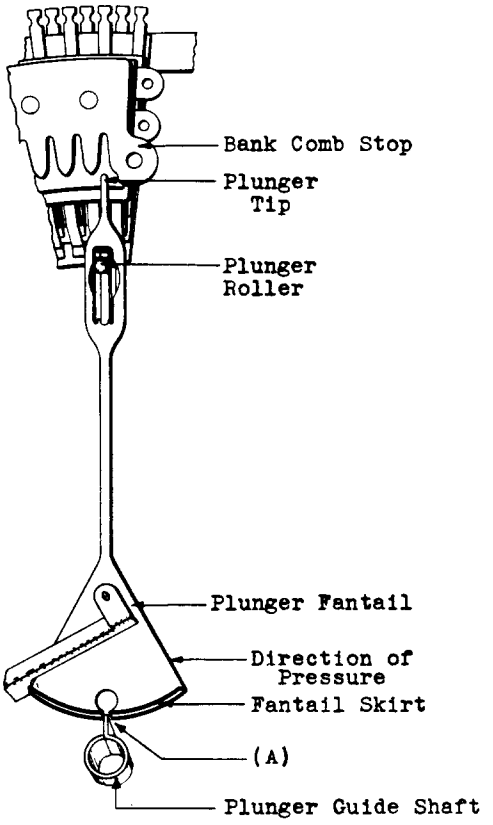

Fig. 6 — Re-engagement of Plunger with Plunger Guide Shaft

2.13 ***Angle of Bank With Rods:*** The lower surface of the bank shall be approximately at right angles with the rods on which it is mounted.

Gauge by eye.

2.14 ***Bank Spacing:*** The clearances between adjacent banks mounted on the same rods shall be approximately equal.

Gauge by eye.

2.15 ***Relation of Plunger Tip to Bank Comb Slot:*** Fig. 7(A)

(a) The plunger tip shall enter and leave the bank without binding, and the plunger rollers shall engage the upper and lower outside bank contact springs at approximately the same time.

Gauge by eye.

(b) The plunger tip shall normally have no appreciable tension against either the upper

or lower side of the slot but may rub very lightly on either side of the slot.

Gauge by feel.

2.16 *Direction of Plunger:* Fig. 8(A)—With the plunger guide shaft holding the plunger opposite the No. 2 trunk, it shall not be possible to direct the plunger into either of the adjacent trunks without bending the plunger nor shall it be possible for the plunger to re-engage the plunger guide shaft from an adjacent trunk. This requirement shall also be met with the plunger guide shaft holding the plunger opposite the No. 9 trunk.

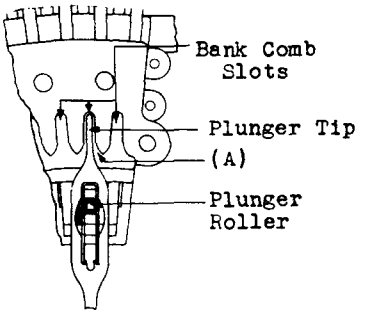

Fig. 7 — Relation of Plunger Tip to Bank Comb Slot

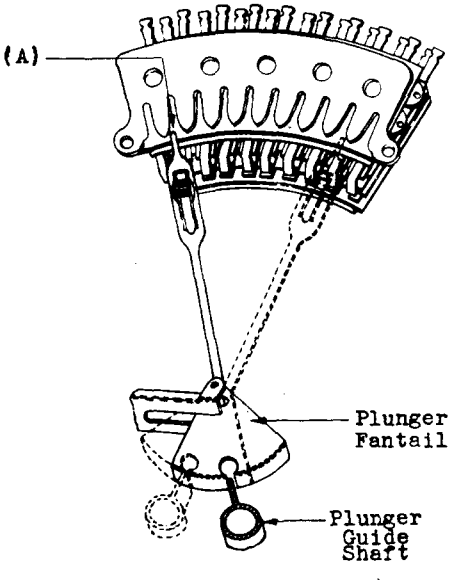

Fig. 8 — Engagement of Plunger With Bank Comb

2.17 *Plunger Restoring Spring Position:* Fig. 9(A) (primary line switch only)

(a) With the B relay electrically operated, the plunger restoring spring roller shall contact the offset portion of the restoring spring and shall center on the width of the spring within $\pm 1/32$ inch.

Gauge by eye.

(b) There shall be a clearance between the edge of the plunger restoring spring and the plunger armature.

Gauge by eye.

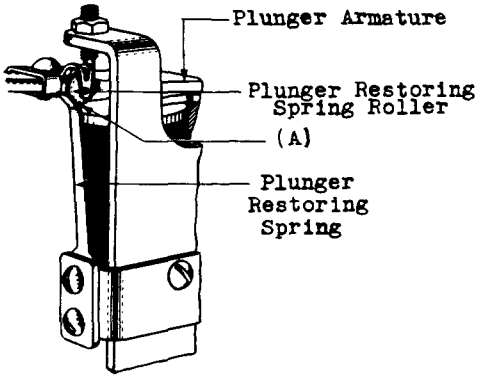

Fig. 9 — Plunger Restoring Spring Position

2.18 *Plunger Restoring Spring Roller Movement:* Fig. 10(A)—(primary line switch only) The plunger restoring spring roller shall turn freely on its bearing pin.

Gauge by feel.

2.19 *Class-of-Service Contact Spring Gauging:* Fig. 10(B)—(primary line switch only) On switches equipped with class-of-service contact springs, the springs shall meet the spring gauging limits specified on the circuit requirement table or relay adjustment sheet.

2.20 *Clearance Between Plunger Armature Lever and Plunger Armature Lever Backstop:* Fig. 11(A) — (secondary and out-trunk switches only) There shall be a clearance between the plunger armature lever and the plunger armature lever backstop with the B relay unoperated and the plunger armature resting against the plunger armature backstop screw.

Gauge by eye.

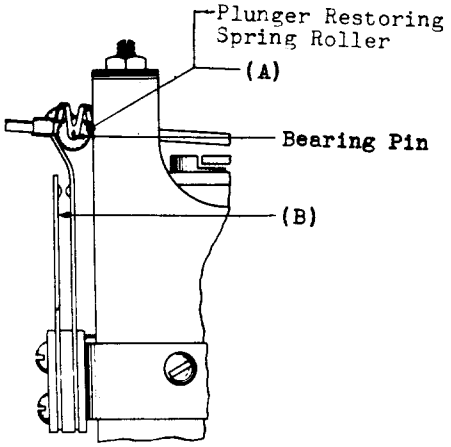

Fig. 10 — Class-of-Service Contact Spring Assembly

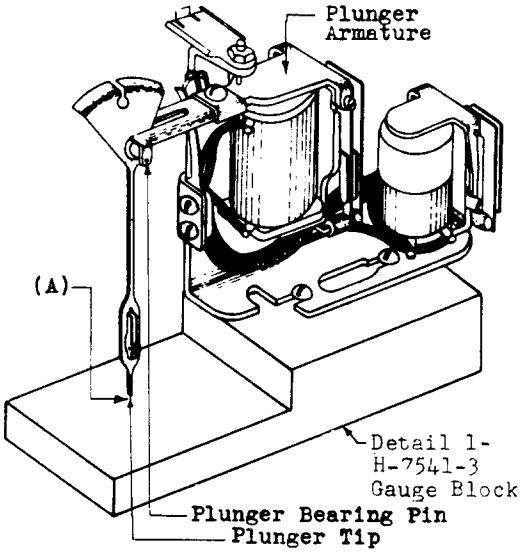

Fig. 12 — Gauging Plunger Armature Stroke — Armature Operated

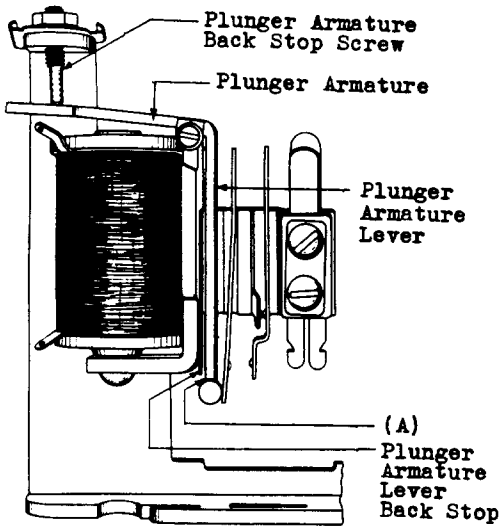

Fig. 11 — B Relay (pulldown magnet)

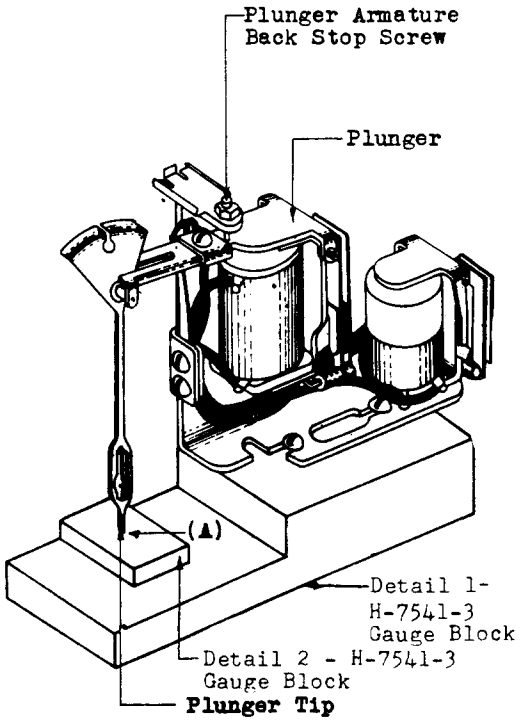

Fig. 13 — Gauging Plunger Armature Stroke — Armature Unoperated

2.21** ***Plunger Armature Stroke

(a) Fig. 12(A) — With the switch firmly mounted on detail 1 of the H-7541-3 gauge block and with the plunger armature resting against the relay core, the tip of the plunger when perpendicular shall just touch the surface of detail 1.

(b) Fig. 13(A) — With the plunger armature resting against the backstop screw, the tip of the plunger shall just touch the upper surface of detail 2 which shall be placed on detail 1.

2.22** ***Freedom of Plunger Movement: The plunger shall not bind on its bearing pin.

Gauge by eye and feel.

2.23 ***Electrical Requirements:*** The B relay (pull-down magnet) shall meet the electrical requirements specified on the circuit requirement table.

3. ADJUSTING PROCEDURES

3.001 ***List of Tools, Gauges, and Materials***

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
338	Spring Insulator
373D	Contact Burnisher Holder
374A	Contact Burnisher Blade
405A	Bumper
416B	Spring Adjuster
417A	1/4- and 3/8-Inch Hex Open Double-End Flat Wrench
418A	5/16- and 7/32-Inch Hex Open Double-End Flat Wrench
KS-2631	Screwdriver
KS-6015	Duck-Bill Pliers
R-2969	Typewriter Brush
AECo H-7068-3	Bank Contact Adjuster
AECo H-10001-3	Plunger Arm Adjuster
AECo H-13701	Frame Adjuster
—	4-Ounce Riveting Hammer
—	5-Inch Diagonal Pliers
—	Long-Nose Pliers
—	3-Inch C Screwdriver
—	6-Inch C Screwdriver
GAUGES	
KS-6909	Thickness Gauge Nest
AECo H-7541-3	Line Switch Plunger Gauge Block
MATERIALS	
—	Hardwood Toothpicks, Flat at one End and Pointed at the Other (obtain locally)

3.002 ***Removing Switch:*** If it is necessary to remove a switch, proceed as follows:

(1) Disengage the plunger fantail slot from the plunger guide shaft. Set the plunger guide shaft to the extreme right or left away from the switch to be removed. Loosen the two switch mounting screws with the KS-2631 screwdriver.

(2) With the switch in this position, move it either to the right or left, depending whether it is a right- or left-hand switch, until the slots in the switch frame are in a position to allow the switch to be removed.

(3) With the switch removed, observe that the jack springs make contact with each other as specified on the circuit drawing. Also insulate with No. 338 insulators those springs that should not touch. If necessary, adjust the springs with the KS-6015 duck-bill pliers.

3.003 ***Remounting Switch:*** To remount the switch, remove the No. 338 insulators and place a toothpick between each set of contact springs. Move the guide shaft as far as possible from the side on which the switch is to be mounted. Engage the tips of the switch jacks with those of the jacks on the shelf. Insert the plunger tip in the slot of the trunk farthest from the switch. Move the switch into its proper position on the shelf and tighten the mounting screws with the KS-2631 screwdriver. Check requirements 2.06, 2.08, 2.09, 2.10, 2.11, 2.12, 2.15, and 2.18.

3.01 ***Cleaning*** (Reqt 2.01)

(1) Clean and treat the relay contacts in accordance with the section covering cleaning and reconditioning relay contacts.

(2) Clean the tip and ring bank contacts in accordance with Section A503.657.

(3) Remove dust or loose particles from the switch using the R-2969 brush.

3.02 ***Form of Bank Contact Springs*** (Reqt 2.02)

3.03 ***Contact Spring and Bank Contact Clearance*** (Reqt 2.03)

(1) To adjust the springs, insert the H-7068-3 spring adjuster between the switches and place the slot in the end of the adjuster over the contact spring which is to be adjusted, as shown in Fig. 14. Twist the handle of the spring adjuster as required. As these springs are very susceptible to the action of the spring adjuster, exercise care not to twist them excessively.

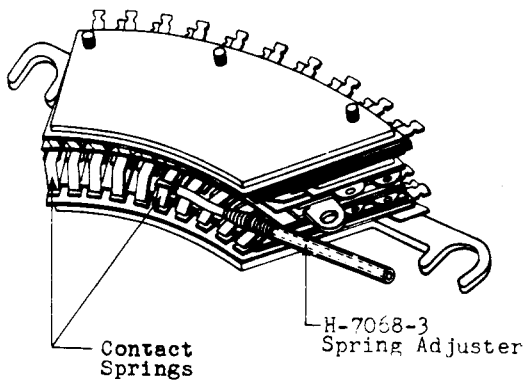

Fig. 14 — Adjusting for Contact Spring and Bank Contact Clearance

3.04 ***Plunger Roller Movement*** (Reqt 2.04)

(1) If the plunger rollers do not turn freely on their bearings, replace the rollers as covered in Section A508.402.

3.05 ***Straightness of Plunger*** (Reqt 2.05)

(1) If the plunger is not straight or is twisted, adjust it with the KS-6015 duck-bill pliers. Exercise care not to introduce any sharp bends in the plunger. It may be necessary to remove the switch as covered in 3.002 to make this adjustment.

3.06 ***Plunger Oscillation*** (Reqt 2.06)

(1) If there is a perceptible change in the depth of engagement of the plunger guide shaft and plunger fantail slot as the master switch oscillates, it is an indication that the plunger bearing pin and the plunger guide shaft are not concentrically aligned. This may be due to the switch being too far to the left or right with respect to the guide shaft.

(2) To correct this condition, loosen the switch mounting screws slightly with the KS-2631 screwdriver, place the No. 405A bumper against the switch frame and tap it lightly away from the position of greatest engagement with the 4-ounce riveting hammer. (See Fig. 17.) After making this adjustment, check requirements 2.08, 2.09, 2.10, 2.11, 2.12, and 2.16.

3.07 ***Fantail Slot and Plunger Guide Shaft Engagement*** (Reqt 2.07)

(1) If the plunger fantail binds on the plunger guide shaft, it may be due to burrs on the side of the slot. Remove the burrs with the No. 374A contact burnisher and No. 373 contact burnisher holder. In no case should a file be used.

(2) If the plunger fantail does not engage the guide shaft to the proper depth, readjust the plunger stroke as covered in 3.21.

3.08 ***Plunger Tip and Bank Comb Tip Clearance*** (Reqt 2.08)

(1) If the plunger tip does not clear the bank comb teeth when the plunger fantail is engaged with the guide shaft and the guide shaft is moved manually from the first to the tenth trunk, it may be due to an individual bank being out of alignment, to the stroke adjustment of the switch being incorrect, or to either or both of the bank rods which support the banks being located too near to the switch. If rubbing of the plunger tip on the bank comb teeth is peculiar only to one switch, it is an indication that the stroke of that switch is incorrect or the bank is located too close to the switch. If rubbing occurs on several switches, the fault may be due to the location of the bank rods.

(2) When rubbing occurs on one switch only, it may be due to the plunger tip rubbing either on one or on both ends of the bank comb. To adjust for either condition, place the pin of the No. 405A bumper in the ear of the bank comb and tap it lightly with the 4-ounce riveting hammer as shown in Fig. 15, so as to move the comb further away from the plunger tip. If the plunger rubs on both ends, make this adjustment on both ends of the comb.

(3) If clearance cannot be obtained by adjusting the bank comb, place the No. 405A bumper against the bank frame as shown in Fig. 16 and tap it lightly away from the switch with the 4-ounce riveting hammer.

(4) If neither of these adjustments corrects the trouble, readjust the plunger stroke as covered in 3.21-3.22.

(5) Where several plungers on one half of a shelf rub on the bank comb teeth, either at one end of the comb or at both ends, it is an indi-

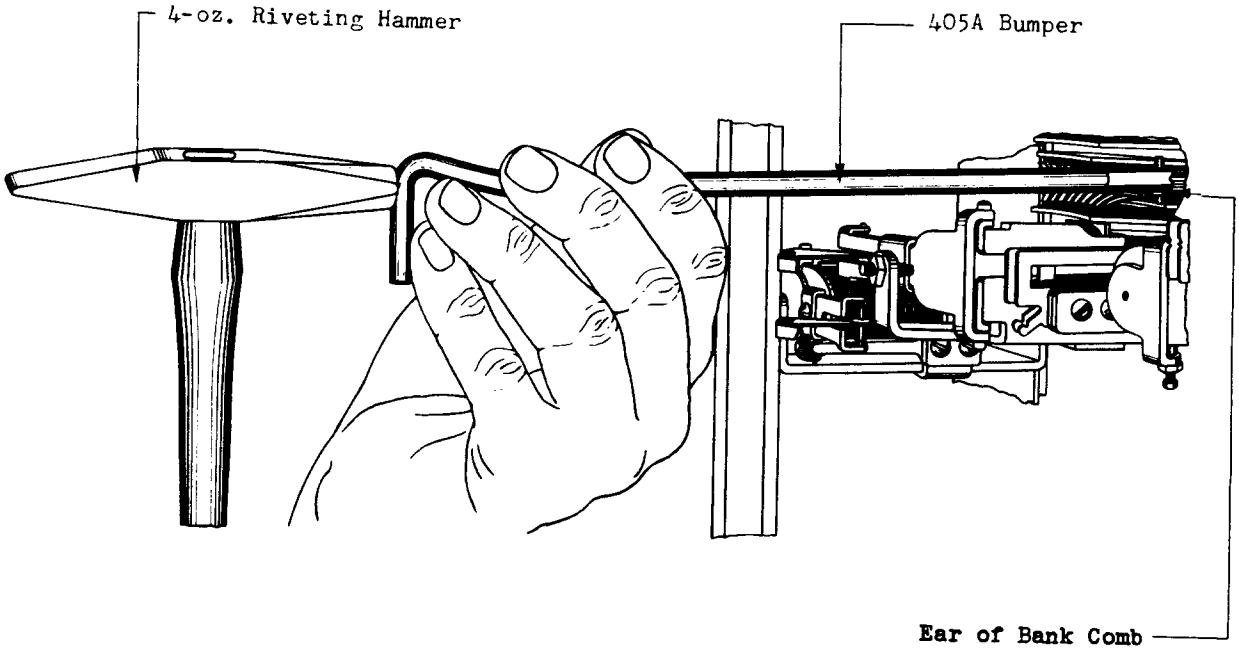

Fig. 15 — Adjusting for Plunger Tip and Bank Comb Tip Clearance

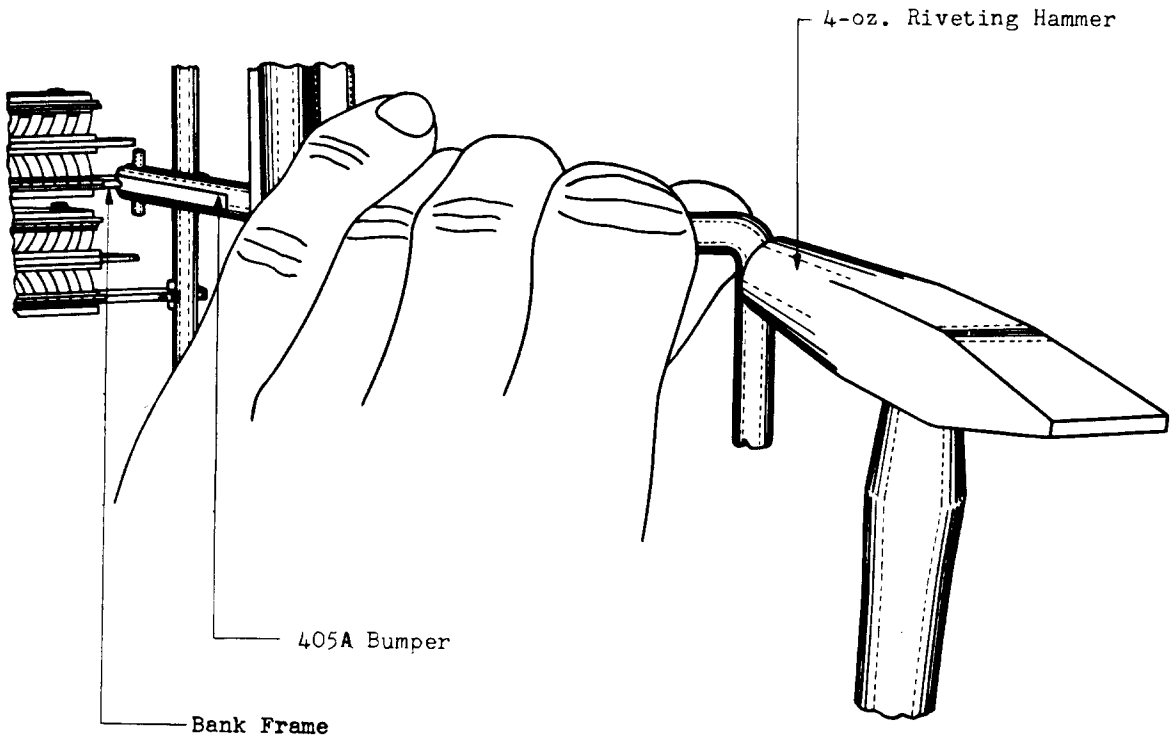

Fig. 16 — Adjusting for Plunger Tip and Bank Comb Tip Clearance

cation that the bank rods are located too close to the switch. To change the position of the bank rods, remove the switches adjacent to the six adjusting bushings on that half of the shelf as covered in 3.002. Loosen the locknuts on the adjusting bushings with the No. 418A wrench and move the bank rods away from the switch by turning the adjusting bushings in a clockwise direction with the No. 417A wrench. Tighten the locknuts, try the new adjustment on the switches remaining on the shelf, and then check requirement 2.16.

(6) Before remounting the switches removed in (5), check requirement 2.21. Remount the switches as covered in 3.003. Check the switches to see that they meet all other requirements.

(7) If there is too much clearance between the plunger tip and bank comb tip, place the No. 405A bumper in the ear of the bank comb and tap it lightly towards the switch with the 4-ounce riveting hammer.

3.09 ***Angle of Switch with Shelf*** (Reqt 2.09)
3.10 ***Fantail Spacing*** (Reqt 2.10)
3.11 ***Clearance Between Plunger Tip and Bank Comb Stop*** (Reqt 2.11)
3.12 ***Re-engagement of Plunger with Plunger Guide Shaft*** (Reqt 2.12)

(1) If the switch does not line up properly with the shelf on which it is mounted or if the space between adjacent plunger fantails is not approximately the same, loosen the switch mounting screws with the KS-2631 screwdriver just enough to permit moving the switch by hand, exercising care not to damage any of the relay windings. Move the switch as required and tighten the mounting screws.

(2) If the plunger bearing pins of adjacent switches touch each other and the bearing pins are long, clip off a portion with the diagonal pliers and then flatten the remaining part with the long-nose pliers. If the bearing pins touch and they are short, the switch probably does not line up properly with the shelf. In this case, proceed as covered in (1).

(3) If there is no clearance between the plunger tip and the bank comb stop when the plunger fantail slot is engaged with the plunger guide shaft on the first or tenth trunks, loosen the switch mounting screws with the KS-2631 screwdriver and then tap the switch to the right or left as necessary with the 4-ounce riveting hammer and the No. 405A bumper as shown in Fig. 17. Recheck requirement 2.06.

(4) If the plunger fantail does not re-engage the plunger guide shaft as specified, loosen the switch mounting screws and shift the position of the switch as described in (3). If this does not correct the trouble, grasp the plunger fantail as shown in Fig. 18 and then press downward in the center and upward at the ends. This will increase the slot opening.

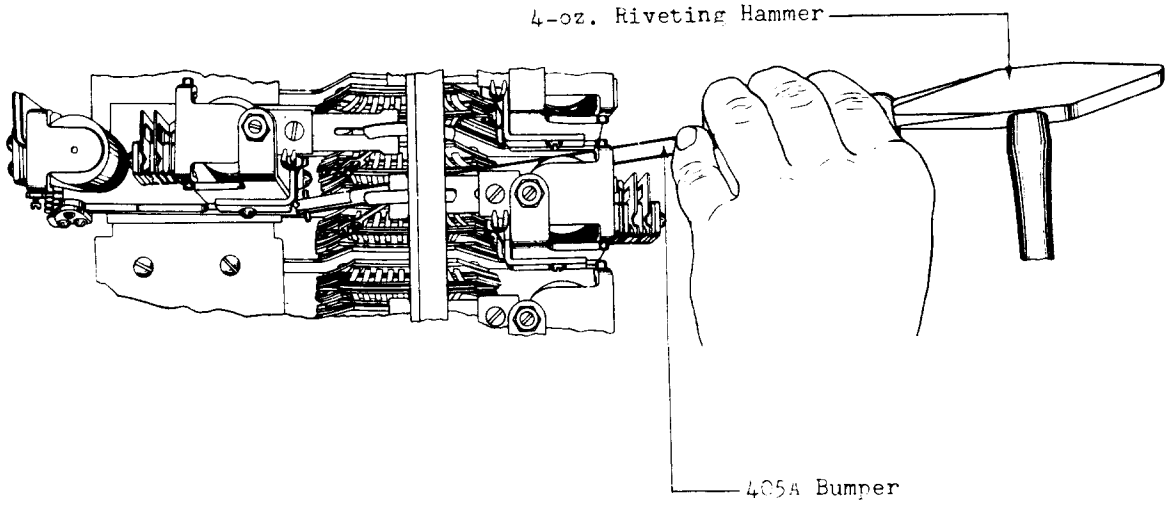

Fig. 17 — Adjusting for Clearance Between Plunger Tip and Bank Comb Stop

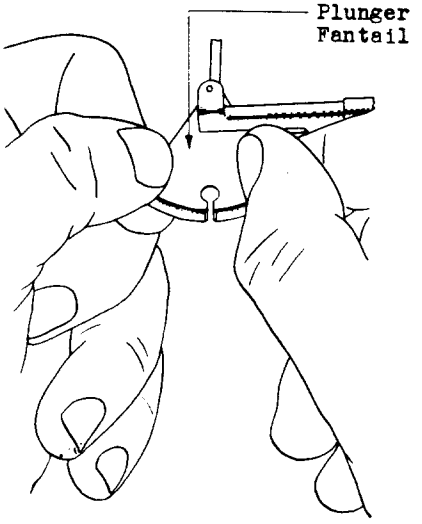

Fig. 18 — Adjusting Plunger Fantail

3.13 ***Angle of Bank with Rods*** (Reqt 2.13)
3.14 ***Bank Spacing*** (Reqt 2.14)
3.15 ***Relation of Plunger Tip to Bank Comb Slot*** (Reqt 2.15)

(1) If the plane of the lower surface of the bank is not approximately at right angles with the rods on which it is mounted, or if the space between adjacent banks is not approximately equal, loosen the clamping collar screws slightly with the KS-2631 screwdriver and place the end of the No. 405A bumper against that part of the bank that engages the mounting rod and tap it gently up or down as required with the 4-ounce riveting hammer.

(2) If the plane of the lower surface of the bank is at approximately right angles to the rods laterally, but the bank is tilted either up or down from front to rear, adjust the bank up or down as required with the H-13701 bank frame adjuster as shown in Fig. 19.

(3) If the plunger rollers do not engage the upper and lower bank springs at approximately the same time, or if the plunger tip binds as it enters the bank or has an appreciable tension against the upper or lower side of the slot, it may be necessary to adjust the bank up or down with the H-13701 bank frame adjuster as shown in Fig. 19. Also note the condition of the plunger tip. If it is bent, adjust it as described in procedure 3.05.

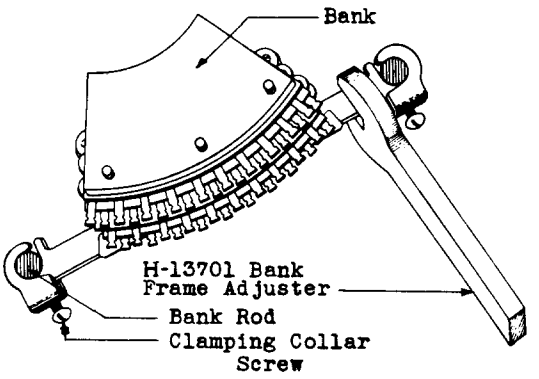

Fig. 19 — Adjusting Angle of Bank With Reference to Bank Rods

(4) After the bank has been adjusted, note that requirement 2.13 is still met.

3.16 ***Direction of Plunger*** (Reqt 2.16)

(1) If it is possible to direct the plunger into an adjacent trunk under the conditions specified, it is an indication that the bank comb is located too far from the switch. To correct this condition change the position of the bank comb by placing the pin of the No. 405A bumper in the ear of the bank comb as shown in Fig. 15. Move the comb towards the switch by tapping the bumper lightly with the 4-ounce riveting hammer until the plunger tip just clears the bank comb as the plunger oscillates under control of the guide shaft.

(2) Where it is possible to force several plungers on one half of a shelf into adjacent trunks, it is an indication that the bank rods are located too far from the switch. To change the position of the bank rods remove the line switches adjacent to the adjusting bushings on that half of the shelf as described in procedure 3.002. Loosen the locknuts on the adjusting bushings with the No. 418A wrench and move the bank rods towards the switch by turning the adjusting bushings in a counterclockwise direction with the No. 417A wrench. Tighten the locknuts and check for clearance between the plunger tips and bank comb teeth.

(3) Before remounting the switches removed in (2), check requirement 2.21. Remount the switches as covered in 3.003. Check the switches to see that they meet all other requirements.

3.17 ***Plunger Restoring Spring Position*** (Reqt 2.17) (primary line switches only)

(1) To change the position of the plunger restoring spring, loosen the plunger restoring spring assembly mounting screws with the 6-inch C screwdriver and shift the spring as required.

3.18 ***Plunger Restoring Spring Roller Movement*** (Reqt 2.18) (primary line switch only)

(1) If the restoring spring roller does not move freely, revolve it a number of times. If this does not work the roller free, remove the roller assembly by removing the roller assembly mounting screw and replace it with a new roller assembly. It is necessary to place two reference marks on the plunger arm at each side of the roller assembly so as to aid in properly positioning the new roller assembly and maintaining the proper length of the plunger arm. Care should be taken to assemble the two parts of the plunger arm so as to obtain its original length. After the new assembly is installed, check requirements 2.06, 2.07, 2.08, 2.11, 2.12, 2.15, and 2.16.

3.19 ***Class-of-Service Contact Spring Gauging*** (Reqt 2.19) (primary line switch only)

(1) If the spring gauging is not within the specified limifs, apply the No. 416A spring adjuster to the springs near where they leave the spring assembly insulators and then give a slight twist to the left or right as required.

3.20 ***Clearance Between Plunger Armature Lever and Plunger Armature Lever Backstop*** (Reqt 2.20) (secondary and out-trunk switches only)

(1) If there is no clearance between the plunger armature lever and the plunger armature lever backstop, adjust the lever away from the backstop with the long-nose pliers.

3.21 ***Plunger Armature Stroke*** (Reqt 2.21)
3.22 ***Freedom of Plunger Movement*** (Reqt 2.22)

(1) If it is necessary to gauge the armature stroke or if the plunger binds on its bearing pin, remove the switch from the frame as covered in 3.002.

(2) In gauging the stroke of the plunger armature, use the H-7541-3 plunger gauge block. The larger block is referred to as detail 1 and the smaller block as detail 2. Mount the switch firmly on detail 1. If, with the plunger armature resting against the core, the tip of the plunger when perpendicular does not just touch the surface of the lower end of detail 1, as shown in Fig. 20, adjust the plunger armature as required at point A with the H-10001-3 plunger arm adjuster.

(3) If, with the plunger armature resting against the plunger armature backstop, the tip of the plunger when perpendicular does not just touch the upper surface on detail 2 as shown on Fig. 21, loosen the plunger armature backstop screw locknut with the No. 418A wrench and turn the plunger armature backstop screw in or out as required. Then check the plunger for plunger movement as covered in (4) through (8).

(4) The plunger is considered as free from bind if when given an impulse with the finger, it will swing as a pendulum and come to rest in a position approximately perpendicular to the upper surface of the plunger gauge block.

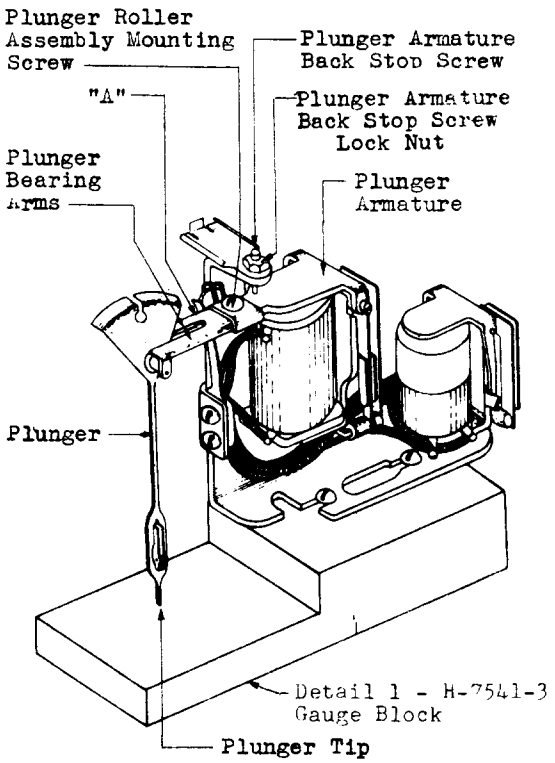

Fig. 20 — Gauging and Adjusting the Plunger Stroke — Armature Operated

(5) If the plunger binds and there is no perceptible play between the plunger bearing arms and the plunger hub, insert the 3-inch C screwdriver between the slot in the plunger bearing arms and twist it slightly as in turning a screw so as to bend the arms outward. The play should be approximately 0.005 inch as judged by eye.

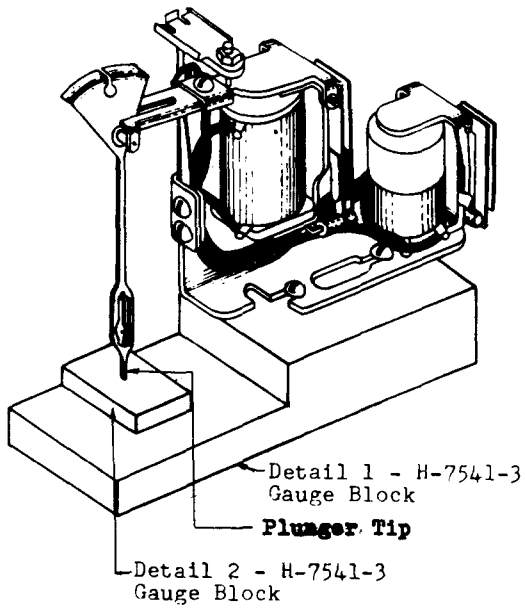

Fig. 21 — Gauging and Adjusting the Plunger Stroke — Armature Unoperated

(6) Bind of the plunger may also be due to the bearing arms being bent outward too far causing them to bind on the bearing pin. In this case adjust the arms inward with the long-nose pliers.

(7) If the bind is not at the bearing arms, it probably is due to a bent bearing pin. To remove the bearing pin, clip the tip from the lower end with the diagonal pliers. Withdraw the bearing pin with the long-nose pliers. Then prepare a new bearing pin by flattening one end with the long-nose pliers for a distance of approximately 1/16 inch from the end. Insert the new bearing pin in place and flatten the other end. Recheck for freedom from bind.

(8) Remount the switch as covered in 3.003.

3.23 ***Electrical Requirements*** (Reqt 2.23)

(1) If the B relay (pulldown magnet) does not meet the electrical requirements specified on the circuit requirement table, adjust the tension of the plunger spring as required with the No. 416B spring adjuster.