

## STUD TYPE ROTARY SWITCHES 34- AND 37-TYPE POTENTIOMETERS, CERTAIN ARTIFICIAL LINES AND ATTENUATORS REQUIREMENTS AND ADJUSTING PROCEDURES

### 1. GENERAL

1.01 This section covers stud type rotary switches used in the following apparatus:

34A, 34B, 37A and 37B Potentiometers  
51B, 51C, D-80948, D-90369 and D-90370 Artificial Lines  
1A and D-78828 Attenuators  
D-81058 Attenuator Panel  
205A and 531A Panels

1.02 Reference shall be made to Section 020-010-711 covering general requirements and definitions for additional information necessary for the proper application of the requirements listed herein.

#### 1.03 Caution

Before checking for mechanical requirements, making any adjustments or performing any cleaning or lubricating procedures remove the potentiometer from service in order to avoid service reactions.

### 2. REQUIREMENTS

#### 2.01 Cleaning and Lubricating

- (a) Fig. 1 (A) - The contact surfaces shall be cleaned and lubricated, when necessary, in accordance with the section covering the cleaning and lubricating of stud type rotary switches.
- (b) The shaft Fig. 2 (A) and (B) and the detent plate Fig. 2 (C) shall be lubricated when necessary.

#### 2.02 Alignment of Contact Springs

- (a) Fig. 2 (D) - The contact surfaces of the contact springs shall be parallel with the contact surfaces of the studs and the collector ring. Gauge by eye.
- (b) Fig. 1 (B) - The contact springs shall be approximately centrally located on each contact stud when the detent roller rests in the corresponding depression in the detent plate and the pointer shall line up with the corresponding mark on the escutcheon plate. On apparatus equipped with dial plates the same requirement applies except that

the corresponding marks on the dial plate shall line up with the line on the indicator. This requirement applies to all contact studs for both clockwise and counter-clockwise rotation of the switch. Gauge by eye.

#### 2.03 Contact Spring Pressure

- (a) Fig. 1 (C) - The pressure of each of the 3 contact spring leaves on the outer row of contact studs shall be  
Min. 200 grams  
Max. 400 grams  
Use 79B gauge.

- (b) The pressure of all other contact spring leaves on the contact studs and collector ring shall be  
Min. 150 grams  
Max. 300 grams  
Use 79B gauge.

#### 2.04 Detent Spring

Fig. 3 (A) - The detent spring pressure shall be as light as possible consistent with insuring the detent roller seating properly in the detent notches and causing a noticeable click when changing from one stud to another.

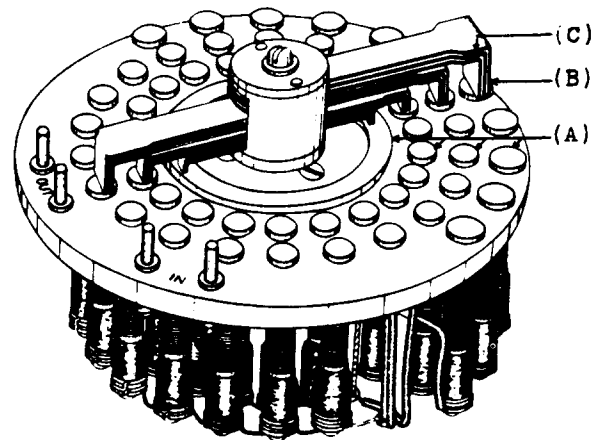


Fig. 1 - Stud Type Rotary Switch

**3. ADJUSTING PROCEDURES****3.001 List of Tools, Gauges and Materials**

<u>Code No.</u>	<u>Description</u>
<u>Tools</u>	
401-A	Oil Gun
417-A	1/4" and 3/8" Hex. Open Double End Flat Wrench
KS-6015	Duck-bill Pliers
-	Bell System Cabinet Screw-driver, 3-1/2" per AT&TCo Drawing 46-X-40

Gauges

79B	0-1000 Gram Push-Pull Tension Gauge
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Materials

KS-2423	Cloth
KS-6232	Oil
-	No. 12 Linen Thread or
-	No. 22 Gauge Bare Tinned Copper Wire
-	No. 17 or 18 Gauge Bare Copper Wire
-	.164"-36 (No.8) nut or
-	.164"-32 Machine Screw and nut

W.E.Co. Petrolatum (Unmedicated White Spec.57997 Vaseline may be used)

**3.01 Cleaning and Lubricating (Rq.2.01)**

(1) Clean and lubricate the contact surfaces in accordance with the section covering the cleaning and lubricating of stud type rotary switches.

(2) If the action of the switch becomes sluggish and it is suspected that this condition is caused by lack of lubricant on the detent or shaft, partial lubrication may be accomplished in the following manner.

(a) Unsolder the IN and OUT leads. Remove the dial by removing the dial mounting screw and washer in the center of the knob (Fig. 2). Remove the dial bushing. Remove the potentiometer from the panel by removing the three mounting screws under the dial. By means of a small length of bare copper wire (No. 17 or 18 gauge) with one end bent at right angles for a distance of about 1/8 inch

apply a small amount of Petrolatum on the detent plate (Fig. 2) and rotate the switch to spread the lubricant. Repeat until a visible film of lubricant covers the entire path of the roller.

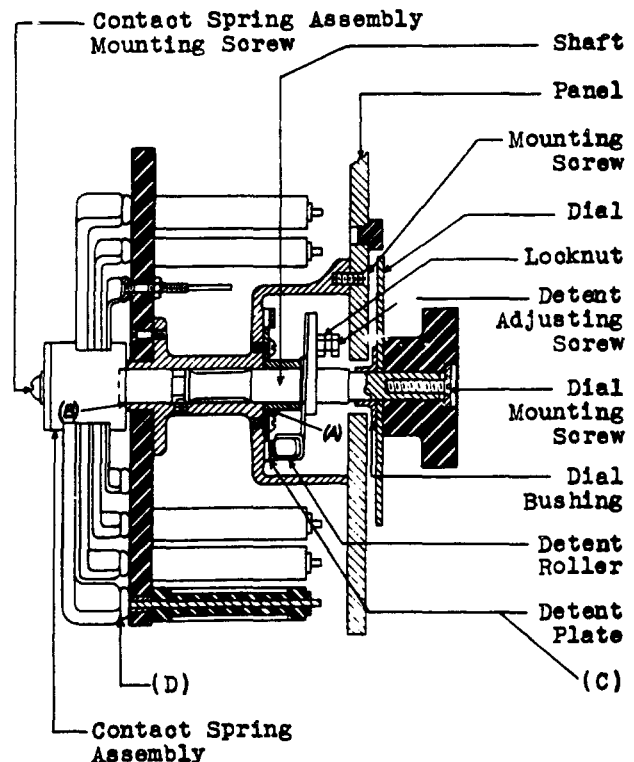


Fig. 2 - Section View

(b) To lubricate the shaft, remove the contact spring assembly by removing the contact spring assembly mounting screw and washer (Fig. 2). To lubricate the shaft at the end next to the panel, (Fig. 2 (A)), apply KS-6232 oil by means of the 401A oil gun inserted thru the slot in the detent spring, (Fig. 3), to the shaft bearing. To lubricate the shaft at the contact spring end apply KS-6232 oil by means of the 401A oil gun to the shaft bearing shown at Fig. 2 (B). The proper amount of lubricant to be applied is obtained by turning the knob of the 401A oil gun six positions.

**3.02 Alignment of Contact Springs (Rq.2.02)**

(1) If adjustments are necessary to secure parallel alignment of the contact springs remove the contact spring assembly from the shaft by removing the contact spring assembly mounting screw and washer (Fig. 2). Then after the spring assembly has been removed from

## 3.02 (Continued)

the shaft this screw shall be placed back in the center hole of the spring assembly and held in place loosely by means of a .164"-36 (No. 8-36) nut. (If an 8-36 nut is not available an 8-32 screw and nut may be used (Fig. 4)). This will prevent the springs, spacers

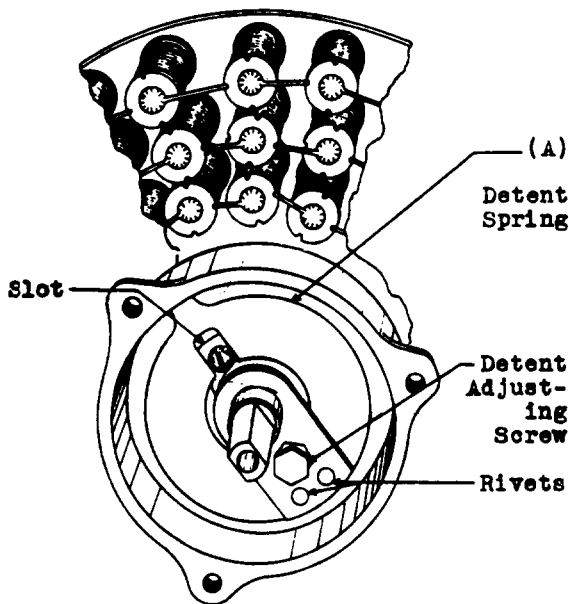


Fig. 3 - End Next to Panel

and insulators of the spring assembly from shifting out of position during subsequent handling. Back out the two spring pileup clamping screws sufficiently to loosen the pileup so that it will be possible to grasp the individual springs with the duck-bill pliers close to the mounting block. These two screws should not be removed completely. Adjust the springs with the pliers until, by trial, the requirement is met after tightening the spring pileup clamping screws and placing the spring assembly back on the shaft. Care shall be exercised to avoid making any kinks or sharp bends in the contact springs. Check the contact spring pressure.

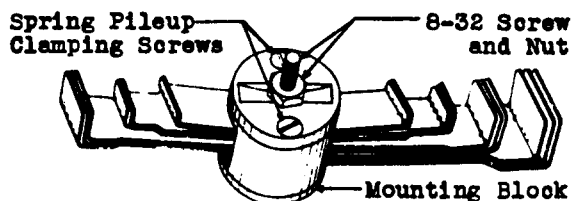


Fig. 4 - Contact Spring Assembly

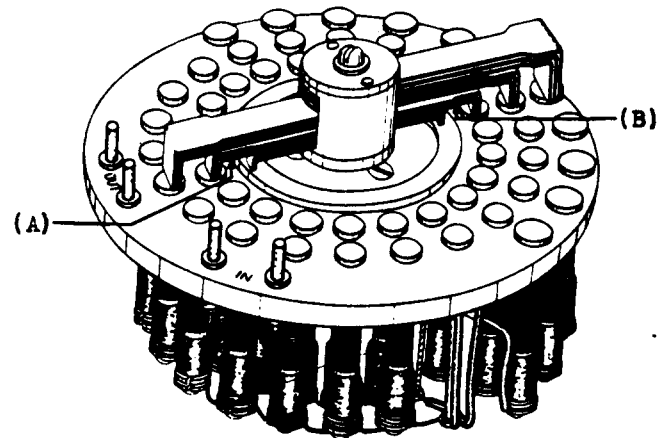


Fig. 5 - Contact Spring End

(2) If the detent roller does not rest in the corresponding depression when the contact springs are centrally located on a contact stud this is probably due to the two rivets (Fig. 3) fastening the detent spring to its support becoming loose, thereby permitting a certain amount of rotation of the contact springs before the detent spring and roller begin to rotate. This may be checked by removing the dial and removing the potentiometer from the panel as covered in 3.01 (2) (a) and then exerting just enough rotating force to rotate the shaft slightly and observing the detent spring. If this condition is found to exist the switch should be returned to the Western Electric Company for repairs as it cannot be remedied properly without removing the shaft assembly.

## 3.03 Contact Spring Pressure (Rq.2.03)

Note: In gauging the pressure of the individual springs care should be taken to insure that each spring moves independently of the others.

(1) Measure the contact spring pressure by looping a piece of No. 12 linen thread or No. 22 gauge bare tinned copper wire under the spring to be checked as close as possible to the bend at the end of the spring. This loop shall be at least 5" in length when taut. To prevent the loop from coming in contact with the edges of the springs above springs (A) and (B) (Fig. 5) the loop should be spread by

3.03 (Continued)

means of a small block of wood with the ends notched. Draw the loop with a 79B gauge in a direction as nearly perpendicular as possible to the plane of the spring without the loop slipping on the spring until the spring just breaks contact, at which point the reading of the gauge indicates the contact pressure.

(2) When the contact pressure of any spring fails to meet the maximum or minimum requirements remove the contact spring assembly and loosen the spring pileup as described in 3.02. Grasp the spring to be adjusted as near as possible to the mounting block with the duck-bill pliers and adjust the spring as required until the proper pressure is obtained after reassembling on the shaft.

Note: When adjusting the springs care shall be exercised to avoid interference with adjacent leaves which may result in their maladjustment. Care shall be taken to avoid making any kinks or sharp

bends in the contact springs. After the adjustments are completed, check to make certain that the requirement regarding the contact springs being parallel to the contact studs and collector rings is met.

3.04 Detent Spring (Rq.2.04)

(1) If the rivets fastening the detent spring to its support (Fig. 3) have become loose no attempt should be made to adjust them but the switch should be returned to the Western Electric Company for repairs.

(2) If the rivets are tight the detent spring pressure adjustment may be accomplished as follows: Remove the potentiometer from the panel as covered in 3.01 (2) (a). Loosen the lock nut on the detent adjusting screw in the detent plate support and tighten or loosen the detent adjusting screw (Fig. 2) as required using the 417A wrench. Tighten the lock nut.