

STUD TYPE ROTARY SWITCHES

D-95522

RHEOSTATS

D-88790, D-88791, D-88792, D-88793, D-91283, D-91378

POTENTIOMETERS

20A, 22A, 22B, 25A, 25B, 26A, 30A, AND 30B TYPES

D-81127, D-81157, D-81158, D-81228, D-81236, D-81238, D-81284, D-81312, D-85675,

D-85738, D-86118, D-88204, D-88205, D-88206, D-88207, D-88328,

D-88702, D-88733, D-90329, D-90330, D-90331, D-91381,

D-92146, D-92147, D-92515, D-93385, D-95140, D-95415

REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the stud type rotary switches, rheostats and potentiometers enumerated above.

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.

2. REQUIREMENTS

2.01 Cleaning and Lubricating

(a) When necessary the contact surfaces shall be cleaned and lubricated in accordance with the section covering the cleaning and lubricating of stud type rotary switches.

(b) The shaft, detent plate and detent stud shall be cleaned and lubricated when necessary.

2.02 Alignment of Contact Springs

(a) The contact surfaces of the contact springs shall be parallel with the contact surfaces of the studs and collector ring segment. Gauge by eye.

(b) The contact springs shall be approximately centrally located on each contact stud when the detent stud 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 counterclockwise rotation of the switch. Gauge by eye.

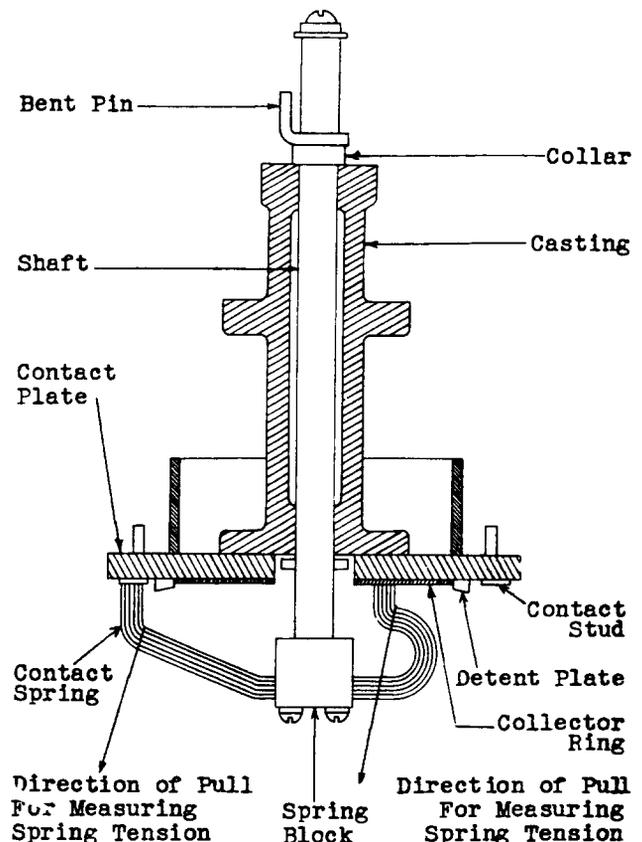


Fig. 1 - View of Potentiometer Showing Contact Springs

2.03 Contact Spring Pressure

(a) The pressure of each leaf of each contact spring against the contact studs shall be:

Minimum 250 grams

Maximum 350 grams

Use the 79B gauge. Refer to Fig. 1.

2.03 (Continued)

(b) The pressure of each leaf of each contact spring against its collector ring shall be:

Minimum 300 grams

Maximum 400 grams

Use the 79B gauge. Refer to Fig. 1.

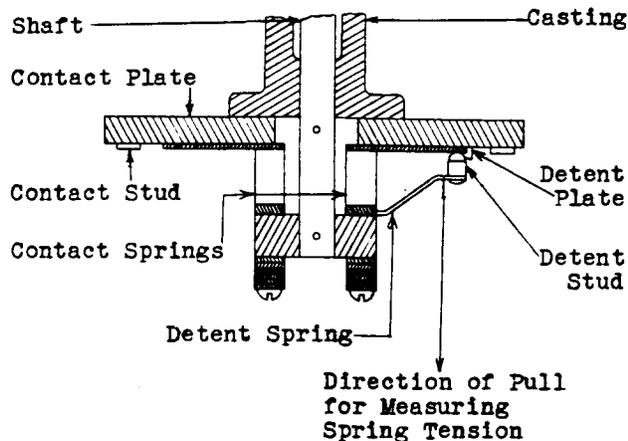


Fig. 2 - View of Potentiometer Showing Detent Spring

2.04 Detent Spring Pressure: The pressure of the detent stud against the detent plate with the stud seated in a depression in the detent plate shall be:

Minimum 600 grams

Maximum 800 grams

Use the 79B gauge and measure at end of spring.

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges and Materials

<u>Code No.</u>	<u>Description</u>
<u>Tools</u>	
KS-6015	Duck-bill Pliers
-	Bell System Cabinet Screwdriver, 3-1/2" per A.T.&T. Co. Drawing 46-X-40
<u>Gauges</u>	
79B	0-3000Gram Push-Pull Tension Gauge
<u>Materials</u>	
KS-2423	Cloth
-	No. 12 Linen Thread or
-	No. 22 Gauge Bare Tinned Copper Wire
W. E. Co. Spec. 57997	Petrolatum (Unmedicated White Vaseline may be used.)

3.01 Cleaning and Lubricating (Rq.2.01)

Caution: Care should be exercised to prevent the fingers from coming into contact with the studs and springs on potentiometers in equipment that may be connected to working circuits, as this may cause serious service reactions.

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

(2) To clean and lubricate the shaft it will be necessary to remove the shaft and spring assembly from the potentiometer. With the 3-1/2" cabinet screwdriver remove the knob screw, then remove the knob itself and then the pointer (or dial plate). In certain apparatus of this general type of construction a dial plate is used instead of an escutcheon plate and pointer. Using the duck-bill pliers pull out the bent pin from the shaft and then remove the collar. Withdraw the shaft and spring assembly. Clean the shaft by wiping it with a clean dry piece of KS-2423 cloth. After cleaning lubricate the shaft with a visible coating of petrolatum per W.E. Co. Specification 57997. Reassemble the parts in the reverse order of their removal.

(3) Clean the detent plate by rubbing it with a clean dry piece of KS-2423 cloth folded over a small piece of wood or the end of the finger to get into the depressions, applying pressure in order to remove all accumulated dirt and lubricant. Clean the detent stud by turning the switch back and forth several times with a clean dry piece of KS-2423 cloth inserted between the detent stud and detent plate. After cleaning lubricate the detent plate with a visible coating of petrolatum per W.E. Co. Specification 57997, taking care to confine the lubricant as much as possible to the path of travel of the detent stud.

3.02 Alignment of Contact Springs (Rq.2.02)

(1) If adjustments are necessary to secure parallel alignment of contact springs remove the shaft and spring assembly as described in 3.01. Adjust the springs with the duck-bill pliers until, by trial, the requirement is met. Reassemble.

Note: Care should be taken to avoid making any kinks or sharp bends in the contact springs.

(2) The adjustment to line up the pointer with the corresponding mark on the escutcheon plate should be made

3.02 (Continued)

previous to the adjustment for centrally locating the contact springs on the contact studs. If the pointer alignment requirement is not met proceed as follows:- Loosen the two screws holding the contact springs and the detent spring to the spring mounting block and holding the detent stud firmly in the bottom of a depression in the detent plate, shift the pointer (or dial plate) to proper alignment by turning the knob. Then, without disturbing the position of the detent stud, the pointer (or dial plate), shift the contact springs until they are located approximately central with the corresponding contact studs. Tighten the screws securely when the adjustments have been completed. To adjust the second set of contact springs loosen the two screws holding this set of springs to the spring mounting block. With the detent stud in the bottom of a depression in the detent plate, shift the springs until they are properly located. Tighten the screws securely when this adjustment has been made. If upon first observation the pointer (or dial plate) is in proper alignment but one or both sets of contact springs are not properly located proceed as above, taking care not to disturb the detent stud, pointer (or dial plate).

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 pressure by looping a piece of No. 12 linen thread or No. 22 gauge bare tinned copper wire under the spring to be measured as near as possible to the bend in the spring and draw the loop with a 79B gram gauge in a direction as nearly perpendicular to the longitudinal axis of the spring as possible without the loop slipping on the spring until the spring just breaks contact with the stud (or collector ring).

(2) When the contact pressure of any spring exceeds the maximum allowable pressure, the spring may be adjusted without the necessity of removing the shaft and spring assembly. Grasp the spring to be adjusted as near the mounting block as possible with the duck-bill pliers and adjust the spring as required until the proper pressure is obtained.

Note: Care should be taken to avoid making any kinks or sharp bends in the contact springs.

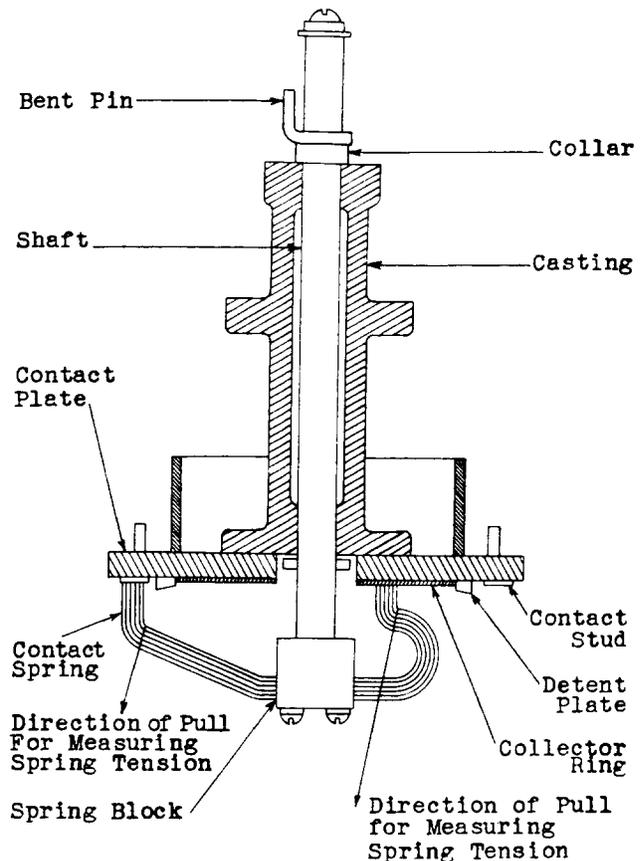


Fig. 3 - View of Potentiometer Showing Contact Springs

(3) When the contact pressure of any spring is less than the minimum allowable pressure, remove the shaft and spring assembly as described in 3.01. Grasp the spring to be adjusted as near the assembly block as possible with the duck-bill pliers and adjust the spring as required until the proper pressure is obtained.

Note: Care should be taken to avoid making any kinks or sharp bends in the contact springs. Maintain parallel spacing of the individual springs as nearly as possible.

Check to see that the contact surfaces of the contact springs are parallel with the contact studs. Adjust as outlined in 3.02 (1).

3.03 (Continued)

(4) The pressure of the contact springs on the collector ring should be measured and adjusted as described above for the pressure of the springs on the contact studs.

3.04 Detent Spring Pressure (Rq.2.04)

(1) To measure the detent spring pressure hook the end of the 79B gram gauge under the end of the detent spring adjacent to the stud and pull the gauge in a direction perpendicular to the detent plate until the stud just leaves its seat in the detent plate.

(2) To decrease the detent spring pressure, bend the spring as required with the duck-bill pliers grasping the spring with the pliers as close as possible to the spring mounting block.

(3) To increase the detent spring pressure it will be necessary to remove the shaft and spring assembly as described in 3.01. Grasp the detent spring as near the mounting block as possible with the duck-bill pliers and adjust the spring as required until the proper pressure is obtained. Reassemble.

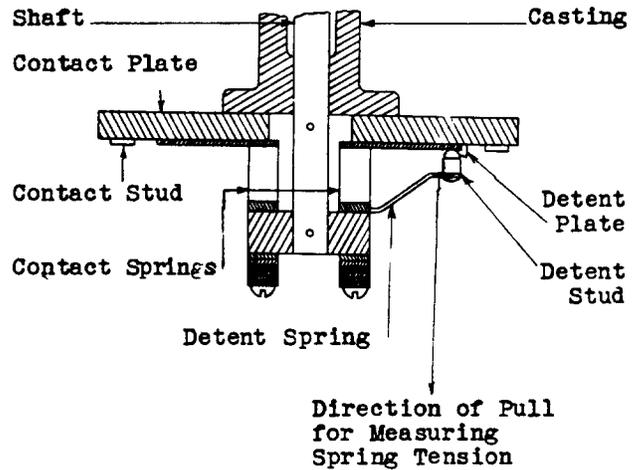


Fig. 4 - View of Potentiometer Showing Detent Spring