216- AND 217-TYPE SWITCHES
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers 216 and 217 type switches.

1.02 This section is reissued to cover the 217 type switch and to revise the operating spring tension requirements and adjusting procedures.

1.03 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.

1.04 Normal position of the switch is either position in which the actuating cam handle points to "OFF" on the switch cover, the latch pin is seated in the notch in the latch block, all contacts are open and the studs are resting against the actuating plate.

1.05 Operated position of the switch is either operated position in which the actuating cam handle points to "ON" on the switch cover, the latch pin is seated in the notch in the latch block and all contacts are closed.

2. REQUIREMENTS

2.01 Cleaning

(a) Contacts shall be cleaned when necessary in accordance with the section covering cleaning of relay contacts and parts. After cleaning any contact a check shall be made to see that both contacts on the bifurcated spring involved close as specified in 2.07 (c).

(b) Other parts shall be cleaned, when necessary, in accordance with the approved procedures.

2.02 Mounting of Switch and Parts

(a) The screws mounting the switch on the framework shall be tight. Gauge by feel.

(b) Fig. 1 (A) and (B) - The actuating plate and the actuating cam bracket shall be mounted securely on the switch. Gauge by feel.

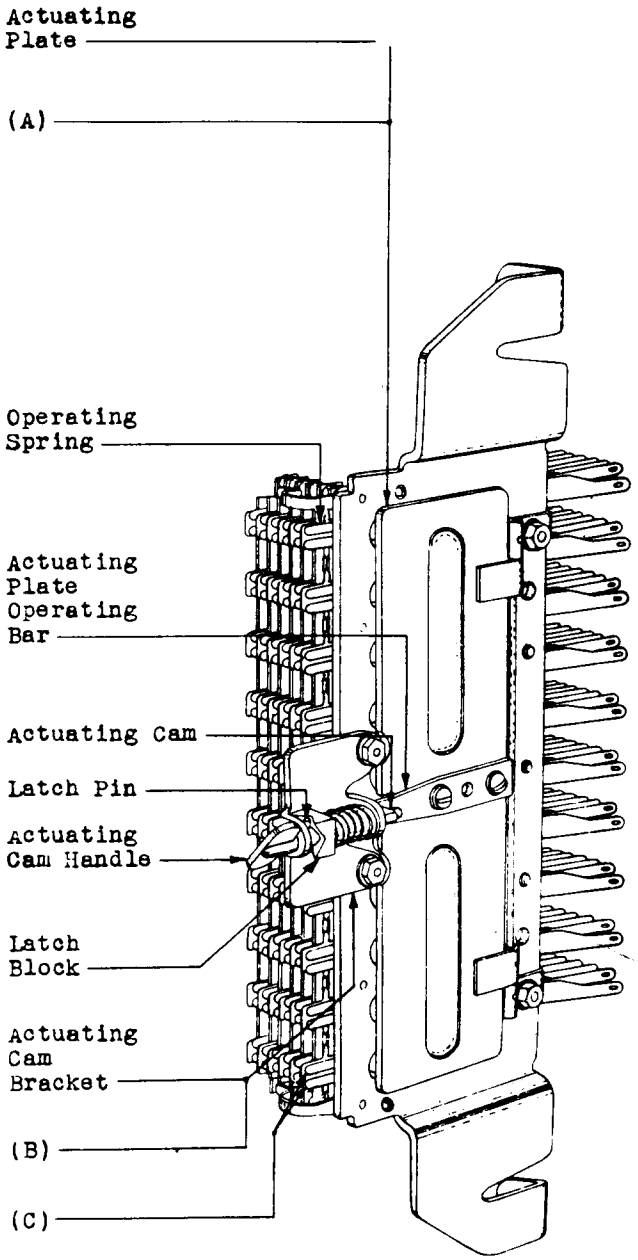

Fig. 1 - No. 216A Switch

2.03 Contact Alignment: The contact alignment shall be within the limits indicated in Fig. 2. Gauge by eye.

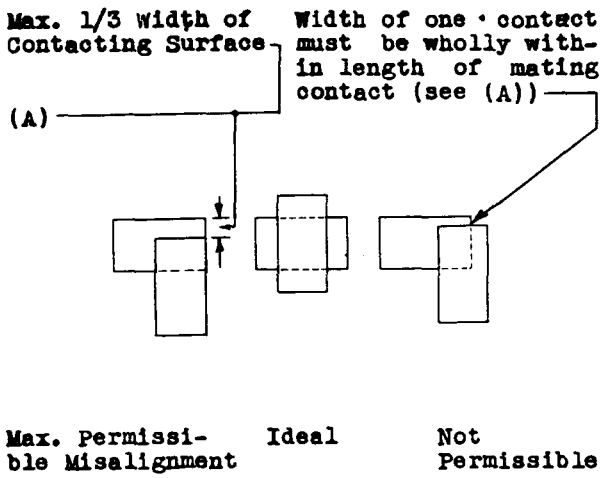

Fig. 2 - Alignment of Contacts

2.04 Operating Spring Tension

Test

The operating spring furthest from the actuating plate in each assembly shall rest firmly against its associated stud and when this spring is moved away from its stud, the associated operating springs shall not follow. Gauge by eye and by feel as follows:

Move the operating spring furthest from the actuating plate away from the stud with the KS-6320 orange stick and note whether or not the other operating springs follow.

Note: If the operating springs follow when the operating spring furthest from the actuating plate is moved away from its stud, the following requirement should be substituted:

Neither contact of the operating spring furthest from the actuating plate shall close when a pressure of
Min. 8 grams
is applied at the tip of the spring in a direction tending to close the contacts. The remaining operating springs may follow and the closure of their contacts is permissible when the operating spring furthest from the actuating plate is moved away from its stud. Apply the tip of the gauge so that it engages both prongs of the bifurcated spring. (See note and caution below). Use the No.70F gauge.

Readjust

Neither contact of the operating spring furthest from the actuating plate shall close when a pressure of
Min. 10 grams
is applied at the tip of the spring in a direction tending to close the contacts. The remaining operating springs may follow and the closure of their contacts is permissible when the operating spring furthest from the actuating plate is moved away from its stud. Apply the tip of the gauge so that it engages both prongs of the bifurcated spring. Use the No. 70F gauge.

Note: When the minimum tension requirements are met, contact separations greater than the minimum values specified in 2.06 will always result on the pair of contacts furthest from the actuating plate.

Caution: After checking the operating spring tension, operate and restore the actuating cam handle a few times restoring it with a "snap" to permit the operating stud to resume its natural position against the actuating plate.

2.05 Spring Clearance - Fig. 3 (A): With the switch in the operated position, the clearance between any operating spring and the associated stationary spring to the left shall be
Min. .005"
→ Gauge by eye. This requirement shall be
→ checked in both operated positions.

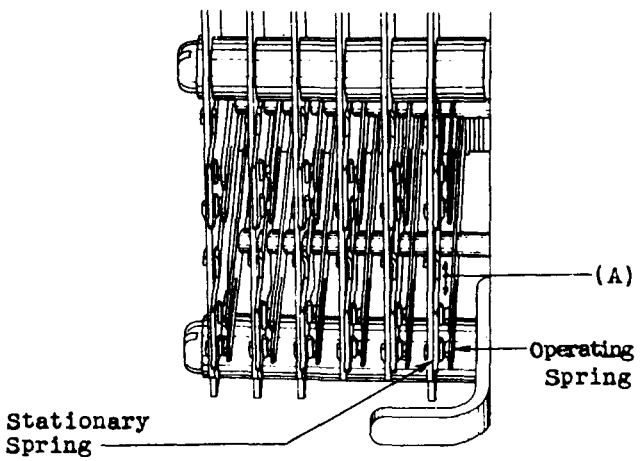

Fig. 3 - Spring Clearance With Switch in Operated Position

2.06 Contact Separation - Fig. 1 (C): With the switch in the normal position, the contact separation shall be
Test - Min. .008", Max. .038"
Readjust - Min. .010", Max. .035"
Use the No. 131A gauge. This requirement shall be checked in both normal positions.

Caution: Before and after checking, operate and restore the actuating cam handle a few times restoring it with a "snap" in order to permit the operating studs to assume their natural position against the actuating plate.

2.07 Front Contact Make (Readjust Only)

(a) Both contacts on each bifurcated spring shall make with their associated contacts when the switch is in the operated position. Gauge by eye. This requirement shall be checked in both operated positions.

Caution: Before and after checking, operate and restore the actuating cam handle a few times restoring it with a "snap" in order to permit the operating studs to assume their natural position against the actuating plate.

(b) To check this requirement operate the switch and note whether the contacts close. In case of doubt as to whether a contact makes, use the KS-6320 orange stick applied to the tip of the bifurcated operating spring and attempt to move the contact towards the associated stationary spring. A movement of the operating spring without a corresponding movement of the associated stationary spring indicates that the contact is not closed.

(c) Whenever a particular contact requires cleaning or build-up removal or when readjustments are made on a contact spring, both contacts on the bifurcated spring involved shall close at approximately the same time. Operate switch slowly and gauge by eye.

3. ADJUSTING PROCEDURES

3.001 List of Tools and Gauges

Code or Spec.No.	Description
Tools	
206	30° Offset Screw-driver
207	90° Offset Screw-driver
524A	Spring Adjuster
524B	Spring Adjuster
535A	Spring Adjuster
544A	1/4" Hex. Offset Socket Wrench
-	5" Regular Screw-driver
KS-6320	Orange Stick
Gauges	
70F	10-0-10 Gram Gauge
131A	Thickness Gauge Nest

3.01 Cleaning (Rq. 2.01)

(1) Clean the contacts in accordance with the section covering cleaning of relay contacts and parts.

(2) Clean the other parts in accordance with the approved procedures.

3.02 Mounting of Switch and Parts (Rq. 2.02)

(1) Tighten the switch mounting screws with the 5" regular screw-driver.

(2) Tighten the actuating plate and actuating cam bracket mounting nuts with the No. 544A wrench.

3.03 Contact Alignment (Rq. 2.03)

(1) If the contacts are not properly aligned, refer the matter to the supervisor.

3.04 Operating Spring Tension (Rq. 2.04)

(1) If this requirement is not met, check the contact separation on the spring at fault and, if necessary, increase the contact separation so it is not less than .018" by adjusting the individual members of the spring as outlined in 3.05-3.07. If the requirement still is not met, proceed to retension the operating spring furthest from the actuating plate as follows.

(2) Use the No. 524A spring adjuster where the adjuster can be applied from above the spring to be adjusted and the No. 524B spring adjuster where the adjuster must be applied from beneath the spring.

(3) Place the proper spring adjuster on the spring and slide it back to the base of the spring. Adjust the spring to the right, exercising care not to disturb adjacent springs. Then draw the adjuster forward slightly and repeat the adjusting operation. Recheck the spring tension and contact separation. Do not adjust the spring any more than necessary since excessive adjusting will decrease the spring clearance and contact separation on this spring. Take care when adjusting springs to avoid tilting. Tilted springs cause unequal contact separation of the two pairs of contacts and may result in failure of one of the contacts on the bifurcated spring to close. Make sure that the contact sep-

aration on the spring just adjusted is not less than .018" and if necessary adjust the individual members of the spring as covered in 3.05-3.07.

(4) If the requirement still is not met, apply the adjuster just in front of the point where the adjuster was last applied and repeat the adjusting operation. Proceed in this manner till the requirement is met. Make sure that 2.05 (Spring Clearance) is satisfactory.

3.05 Spring Clearance (Rq. 2.05)
3.06 Contact Separation (Rq. 2.06)
3.07 Front Contact Make (Rq. 2.07)

(1) Where these requirements are not met, first make sure that 2.04, (Operating Spring Tension) is met. Also determine whether the condition is confined to a few springs or is general throughout the switch.

Spring Clearance

(2) If failure to meet this requirement is common throughout the switch, determine first if increasing the contact separation as covered in (4) will correct this condition, otherwise refer the matter to the supervisor. However, if failure to meet the requirement is confined to the tips of a bifurcated operating spring, adjust the individual members of the spring as outlined in (3).

Contact Separation
Front Contact Make

(3) Where the Condition is Confined to Individual Springs: Adjust the members of the bifurcated operating springs as required with the No. 535A spring adjusted applied near the outer end of the spring, taking care that the contact separation of the two members is approximately equal. In making these adjustments, always adjust the contact separation toward the minimum permissible amount.

(4) Where the Condition is General Throughout the Switch: Loosen the actuating plate operating bar mounting screws with the Nos. 206 and 207 offset screw-drivers and reposition the bar. Moving the bar toward the front of the switch will decrease the contact separation and moving the bar toward the rear will increase the contact separation of all the contacts. Securely tighten the actuating plate operating bar mounting screws and make sure that the spring clearance is satisfactorily met.