

## REQUIREMENTS AND ADJUSTING PROCEDURES

### 22-TYPE DROPS

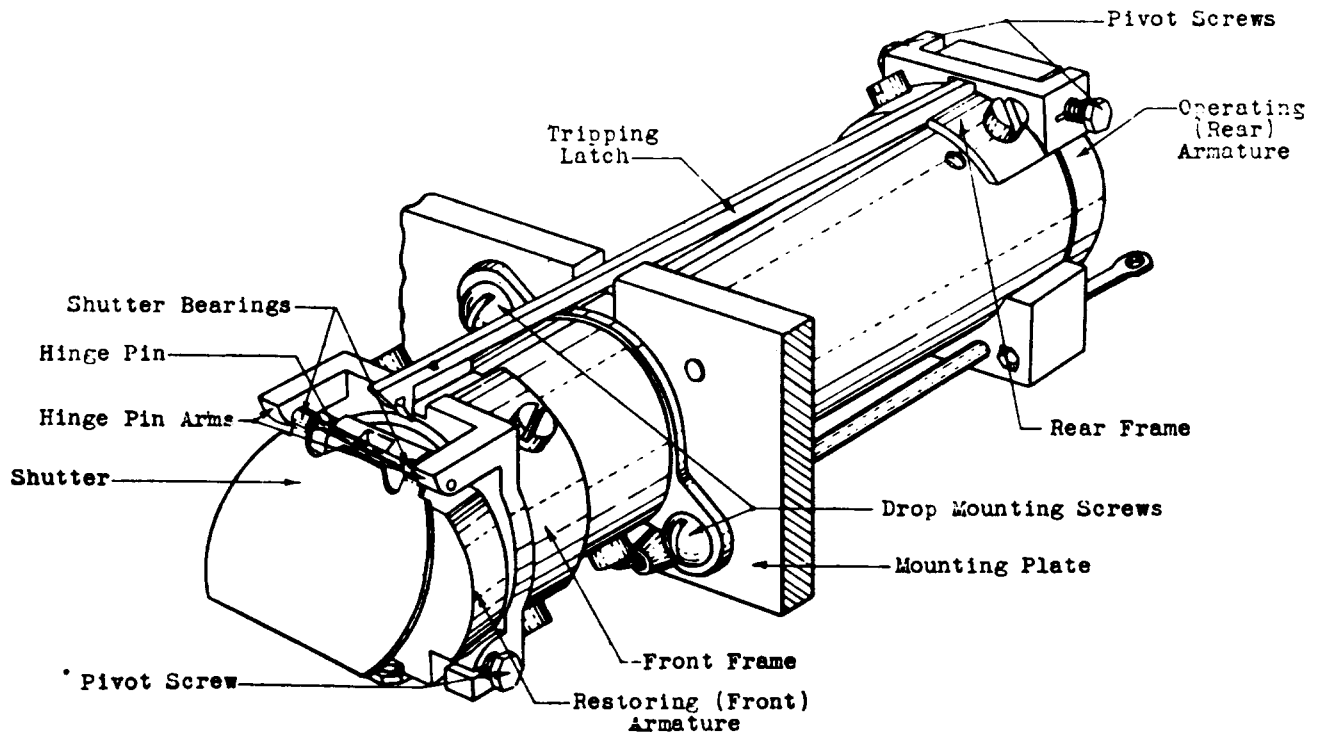
#### 1. GENERAL

- 1.01 This section covers 22-type drops.
- 1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.
- 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 Part 1 "General" and Part 2, "Requirements" form part of the Western Electric Co. Inc. Installation Department Handbook.
- 1.05 *Operate (Line Winding)* means that when the specified operate current is applied to

the line winding, the operating (rear) armature shall move towards its core sufficiently to release the restoring (front) armature, which shall close the contacts and cause the shutter to move to its indicating position.

1.06 *Release (Line Winding)* means that when the specified operate current is reduced to open circuit the operating (rear) armature shall return to the unoperated position so that the tripping latch will be in position to engage the restoring (front) armature.

1.07 *Operate (Restoring Winding)* means that when the specified operate current is applied to the restoring winding, the restoring (front) armature shall move towards its core sufficiently to engage the tripping latch and open the contacts and allow the shutter to assume its normal position.



22-Type Drop

Fig. 1

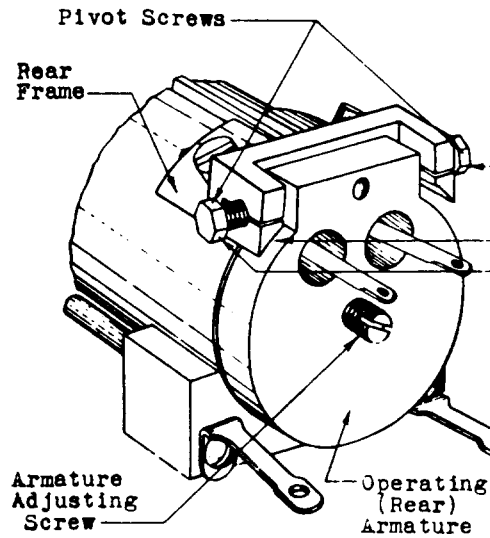


Fig. 2

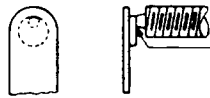


Fig. 3

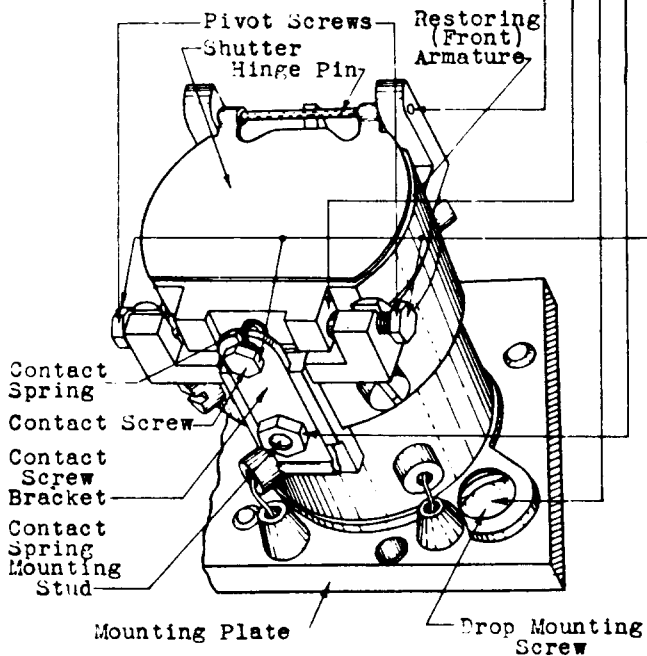


Fig. 4

## 2. REQUIREMENTS

**2.01 Drop Mounting:** Both front and rear parts of the drop shall be securely fastened to the mounting plate. Gauge by feel.

**2.02 Armature Movement:** The operating (rear) and restoring (front) armatures shall move freely in their bearings and shall have a slight but not excessive "Side Play." Excessive shall be interpreted to mean more than .005". The side play shall be measured when the armatures are moved from side to side in line with the axes of their pivot screws. Gauge by feel and by eye.

**2.03 Shutter Movement:** The shutter shall move freely on the hinge pin. Gauge by feel.

**2.04 Tripping Latch Movement and Position:** The tripping latch shall move freely and shall not touch the sides of the slot in the mounting plate and front frame with the side play of the operating (rear) armature taken up in both directions. Gauge by feel and by eye.

**2.05 Contact Alignment:** Contacts shall line up so that the point of contact falls wholly within the circumference of the opposing contact disc. Gauge by eye.

**2.06 Tightness of Spring Assembly Clamping Nut:** The nut shall be sufficiently tight to hold the contact spring and contact screw bracket in their proper positions. Gauge by feel.

**2.07 Tightness of Contact and Pivot Screws:** The contact and pivot screws shall be sufficiently tight in their brackets to hold any adjusted position. Gauge by feel.

**2.08 Contact Separation:** There shall be perceptible clearance (approximately .005") between the contact spring and the contact screw with the tripping latch engaged with the restoring (front) armature. Gauge by eye.

**2.09 Electrical Requirements:** The drop shall meet the electrical requirements specified on the "Circuit Requirement Table."

### 2.10 Cleaning

(a) The contacts shall be cleaned when necessary in accordance with approved procedures.

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

### 3. ADJUSTING PROCEDURES

CODE NO.	DESCRIPTION
<b>TOOLS</b>	
35	Screwdriver — 3-1/2"
74	Wrench — 5/32" and 7/32" Hex. Open Double-end — Flat
349	Wrench — 3/16" and 7/32" Hex. Closed Double-end — Offset
KS-6015	Duck-bill Pliers
—	Bell System — Cabinet Screwdriver — 3-1/2" per A.T.&T. Co. Dwg. 46-X-40
—	Bell System — P-Long-nose Pliers — 6-1/2" per A.T.&T. Co. Dwg. 46-X-56
<b>MATERIALS</b>	
KS-7860	Petroleum Spirits
—	Toothpicks — Hardwood — Flat at One End and Pointed at Other
<b>TEST APPARATUS</b>	
35-C	Current Flow Test Set

#### 3.01 Drop Mounting (Reqt 2.01)

*M-1* If the drop is not mounted securely, tighten the mounting screws with the 3-1/2" cabinet screwdriver.

#### 3.02 Armature Movement (Reqt 2.02)

*M-1* If either the restoring (front) or operating (rear) armature binds on its bearings, it may be due to dirt or defective bearings. Remove the pivot screws with the No. 74 wrench and clean them and the bearing holes in the armature with KS-7860 petroleum spirits applied with a clean toothpick. The same toothpick should not be used for more than one cleaning operation. Replace the pivot screws and adjust them so that the side play is about .005". One quarter turn of the screw back from finger tight provides approximately .005" side play. Care should be exercised not to turn in one screw much more than the other since otherwise the tripping latch may not

clear the sides of the slot in the mounting plate and front frame or the restoring (front) armature which is counterbored may strike the protruding core. In replacing the screws see that they fit snugly but not too tight. Correct if necessary in accordance with 3.07.

*M-2* If the side play is excessive correct by turning in the pivot screws with the No. 74 wrench.

#### 3.03 Shutter Movement (Reqt 2.03)

*M-1* If the shutter does not move freely on the hinge pin, it may be due to dirt collecting at the bearing points. Remove the pin by grasping it as shown in Fig. 5 with long nose pliers and drawing the pin to the right through the left hinge pin arm until the shutter can be removed.

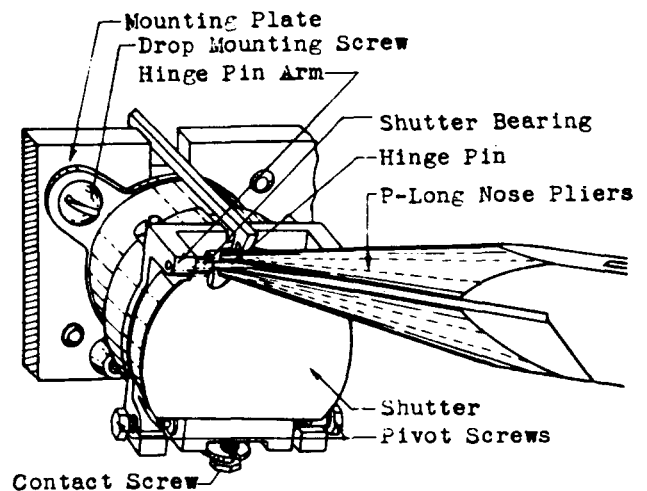


Fig. 5 — Method of Removing Shutter Pin

Clean the shutter bearings and hinge pin with KS-7860 petroleum spirits applied with a clean toothpick. The same toothpick should not be used for more than one operation. Replace the hinge pin and shutter and see that the pin fits loosely in the shutter bearing and that there is a slight amount of side play between the shutter bearing and the hinge pin arms. If the hinge pin does not fit loosely in the shutter bearing open the bearing slightly with a knife blade. To obtain side play adjust the shutter bearings with the long nose pliers.

### 3.04 *Tripping Latch Movement and Position* (Reqt 2.04)

**M-1** If the tripping latch does not clear the slot in the front frame and mounting plate, it may be due to the operating (rear) armature not being centered or the tripping latch not being straight.

**M-2** If the operating (rear) armature is not centered, turn the pivot screws in or out as required. Care should be taken in making this adjustment to see that the armature still operates freely and without too much side play (see requirement 2.02).

**M-3** If the tripping latch is not straight, back off the operating (rear) armature pivot screws with the No. 74 wrench so as to permit removing the operating (rear) armature. Tilt the operating (rear) armature downward so as to lift the front of the tripping latch up and then pull the armature back. After the front of the tripping latch comes through the mounting plate turn the armature through an angle of 180°. This will permit more of the tripping latch to be adjusted. Adjust the tripping latch with the KS-6015 duck-bill pliers. Access for adjusting the tripping latch may also be obtained by removing the two screws that hold the rear frame to the shell. This will permit removing the entire rear frame and armature assembly.

### 3.05 *Contact Alignment* (Reqt 2.05)

### 3.06 *Tightness of Spring Assembly Clamping Nut* (Reqt 2.06)

### 3.07 *Tightness of Contact and Pivot Screws* (Reqt 2.07)

**M-1** If the mounting plate is mounted so that the shutter is nearly flush with the face of the switchboard, it will be necessary to remove the mounting plate from the switchboard to make the following adjustments but if the front frame of the drop projects beyond the face of the switchboard the following adjustments may be made without removing the mounting plate.

**M-2** If the contacts are not in alignment from front to rear, loosen the spring assembly clamping nut slightly with the No. 74 wrench and shift the contact screw bracket as required. Tighten the clamping nut securely.

**M-3** If the contacts are not in alignment sideways or the contact spring is bent so that the contacts do not line up properly, remove the clamping nut with the No. 349 wrench and remove the contact spring bracket and insulators. To shift the contact spring or remove the contact spring so that the spring may be adjusted, it will be necessary to remove the contact spring mounting stud. To do this loosen the stud with the smaller end of the No. 74 wrench and then shift the contact spring as required. Tighten the stud securely and reassemble the parts. To straighten the spring remove the stud and adjust the spring with the duck-bill pliers. After the contact spring has been properly adjusted, reassemble all parts.

**M-4** If the contact or pivot screws are too loose in their brackets, remove them with the No. 74 wrench and close the slot in the bracket as necessary with the long-nose pliers. Replace the screw and if still too loose repeat the adjustment. If the screws are too tight in their brackets, the slot may be widened by forcing the blade of the No. 35 screwdriver into it.

### 3.08 *Contact Separation* (Reqt 2.08)

**M-1** If there is not the required separation between the contact screw and the front contact, turn the contact screw in (to the right) with the No. 74 wrench until the contact screw just touches the front contact. Then turn the contact screw out (to the left) approximately 1/4 turn which should allow a clearance between the front contact and the screw of approximately .005".

### 3.09 *Electrical Requirements* (Reqt 2.09)

**M-1 General:** If the drop fails to meet the electrical requirements, adjust as follows.

**M-2 Operate (Line Winding):** Failure of the drop to meet the operate requirement is probably due to too great an air-gap between the operating (rear) armature and the core when the relay is in the unoperated position. To decrease this gap remove the tripping latch as outlined under 3.04 and change the angle of the latch with respect to the operating

(rear) armature. To do this grasp the latch near where it is fastened to the operating (rear) armature, with the long-nose pliers, then force the armature toward the latch manually. Adjusting toward the latch will decrease the air-gap. Reassemble the parts and if the drop still does not meet the requirement, repeat the adjustment until it does.

**M-3 Release (Line Winding):** Failure of the operating (rear) armature to release is probably due to the air-gap between the armature and the core being too small when the drop is in the operated position. To increase this gap turn the armature adjusting screw in (to the right) with the No. 35 screwdriver until the requirement is met.

**M-4 Operate (Restoring Winding):** If the restoring (front) armature does not return to its unoperated position, turn the contact screw in (to the right) consistent with meeting the contact separation. If necessary, remove the contact spring as outlined in paragraph 3.05 and adjust it so that the spring normally is farther away from the contact screw. This will permit the screw to be turned in further.

### **3.10 Cleaning (Reqt 2.10)**

**M-1** Clean the contacts in accordance with approved procedures.

**M-2** Other parts should be cleaned as specified in paragraph 3.02.