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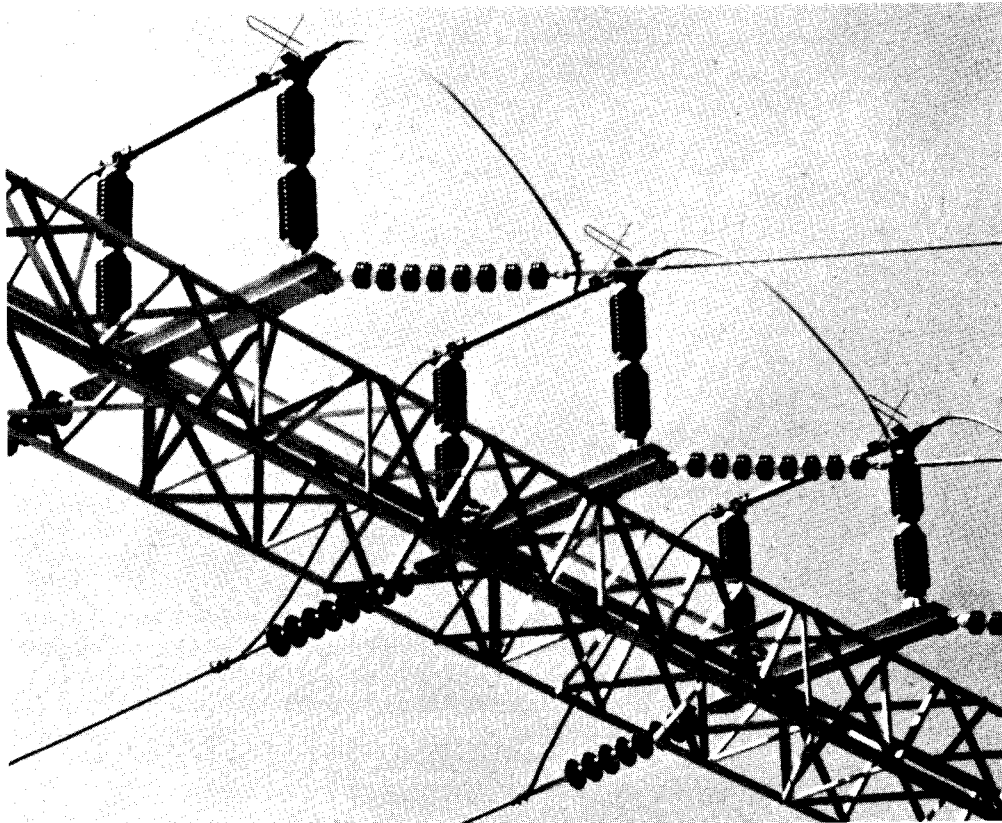
ISSUE B

AIR SWITCHES—OUTDOOR

INSTRUCTIONS

INSTALLATION AND MAINTENANCE

A-7 SIDE-BREAK
GROUP-OPERATED
34.5 THRU 161 KV



IFE Imperial Corporation



INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE OF A-7 SIDE-BREAK SWITCHES

GENERAL

This manual provides instructions for the installation and maintenance of A-7 side-break, group-operated switches and should be read before attempting to install or service the equipment.

RECEIPT

Check the total shipment for completeness against the bill of material and installation drawings. Report any shortages or damages to the carrier immediately and file the proper claim.

INSTALLATION INSTRUCTIONS

If the switches have already been assembled at the factory, omit steps 1, 2, 3, and 4. However, it is recommended that each SWITCH POLE be checked for alignment and proper adjustment after they are mounted on the structure.

1 ASSEMBLE SWITCHES

If the switches are not assembled, assemble the INSULATOR STACKS to SWITCH BASE, Fig. 1. Do not disturb the position of the switch crank when mounting the insulator stack to the rotor bearing, as the crank has been properly located at the factory. After the INSULATOR STACKS are all in place, the live parts should be mounted on top of the STACKS with the switch in the closed position. **IMPORTANT—DO NOT REMOVE COATING FROM JAW AND BLADE CONTACTS.**

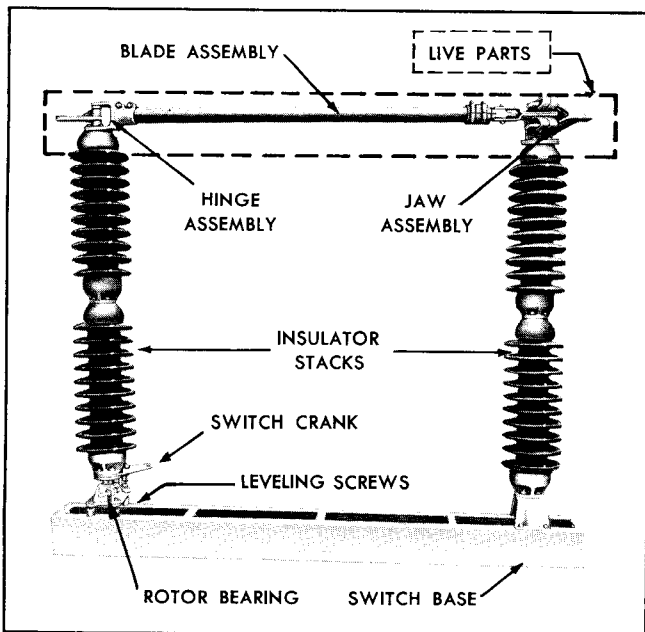


Fig. 1. Single-pole A-7 switch.

2 INSULATOR STACK ALIGNMENT

On 5-inch bolt circle switches, the INSULATOR STACKS can be aligned by placing OPEN-END SHIMS under the INSULATOR SUPPORTS (SPACER or ROTOR BEARING) where the bolts secure them to the SWITCH BASE, or by LEVELING SCREWS (when specified) located where STACKS attach to the SWITCH BASE.

When LEVELING SCREWS are furnished, adjustment, if necessary, is made as follows, Fig. 2:

- a. Loosen the four MOUNTING BOLTS just enough to allow the LEVELING SCREWS to be turned freely to adjust the "X" dimension.
- b. When the STACK is aligned properly, tighten three MOUNTING BOLTS, then before tightening the fourth MOUNTING BOLT, tighten its LEVELING SCREW 1/4 to 1/2 turn to assure proper locking.

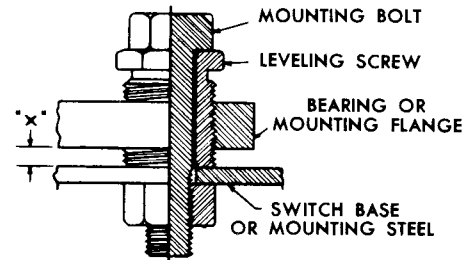


Fig. 2. Leveling screw detail, 5-inch bolt circle.

On 3-inch bolt circle switches, 69 kV and above, the ROTATING INSULATOR STACK is aligned by two ADJUSTING NUTS provided on each of the four MOUNTING BOLTS OF THE ROTOR BEARING. Adjustment is made as follows, Fig. 3:

- a. Loosen the four top ADJUSTING NUTS.
- b. Manipulate the four bottom ADJUSTING NUTS to bring the STACK into proper alignment.
- c. Tighten the top ADJUSTING NUTS.

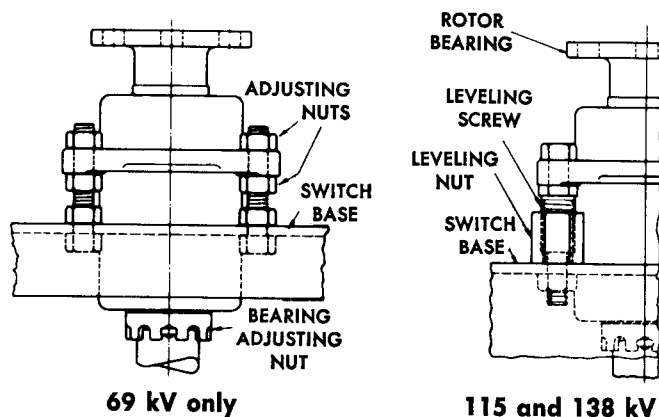


Fig. 3. Leveling screw detail, 3-inch bolt circle.

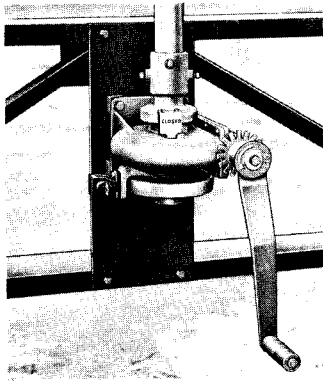


Fig. 8.
Geared mechanism.

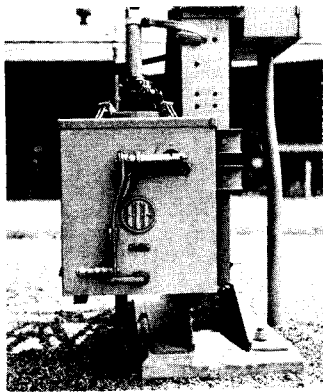


Fig. 9.
Motor mechanism, MO-10.

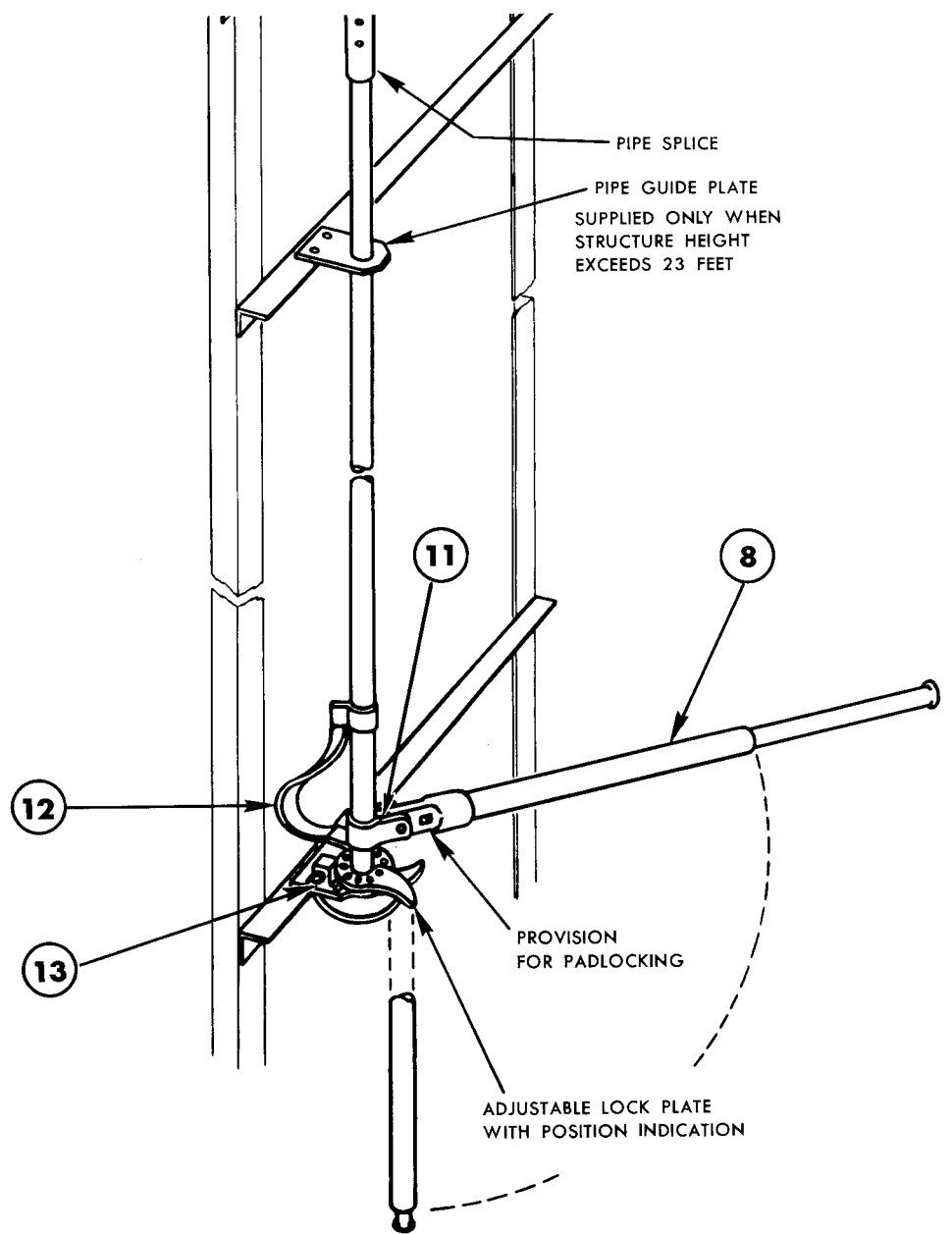
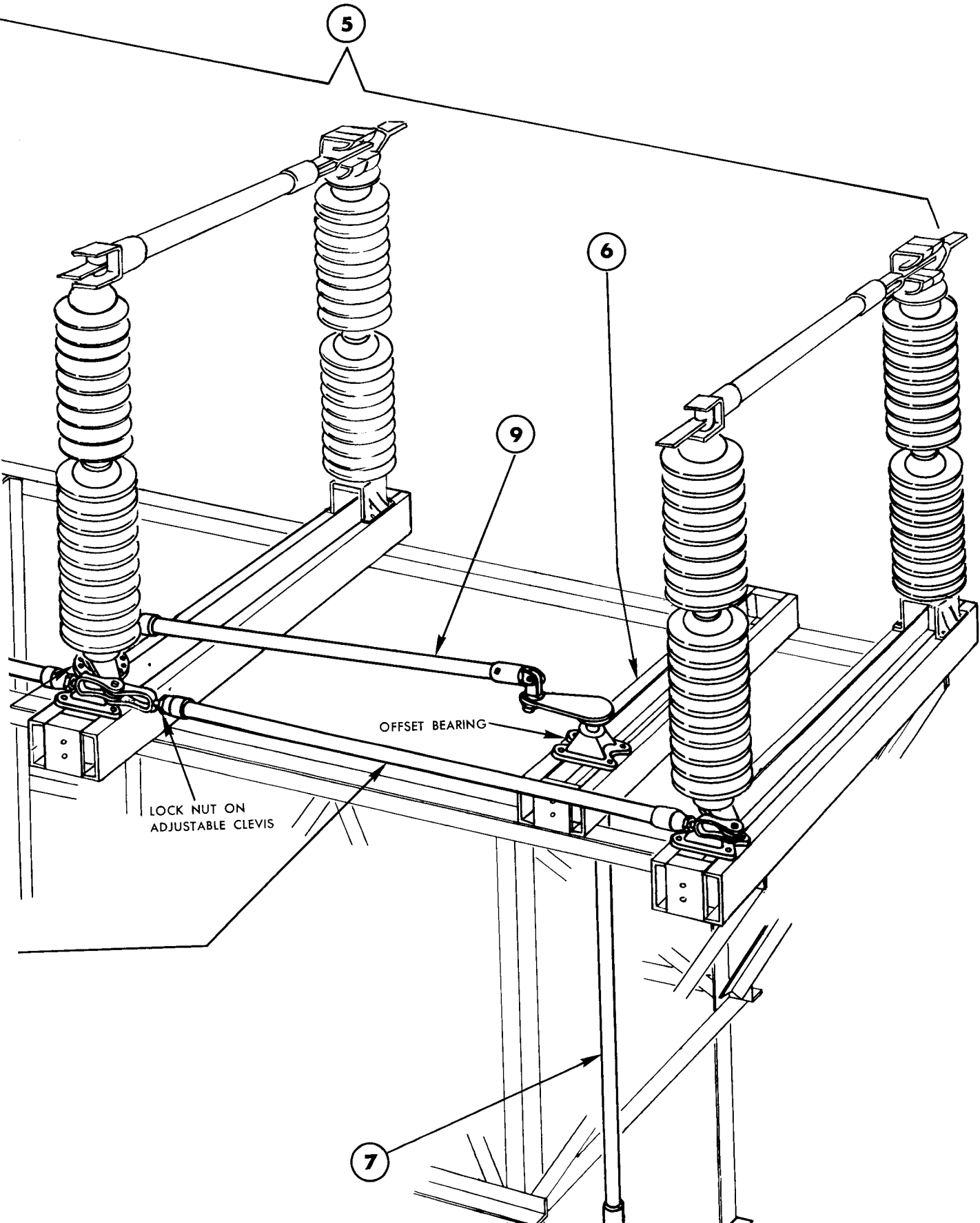


Fig. 10. Typical switch installation.
Horizontal-upright configuration shown.

For the configuration and arrangement supplied for a specific application use this illustration for general information, and the operating mechanism drawing furnished with the shipment for detailed installation information.





SWITCH MAINTENANCE

Although our policy is to produce outdoor switches requiring a minimum of maintenance, a certain amount of care and inspection is required. The frequency of inspection depends on the atmospheric conditions at a given switch location and the frequency of operation. In non-corrosive atmospheres, a switch may operate satisfactorily for many years without care, while in a severe atmosphere such as is encountered at power plants and industrial sites, maintenance may be required in a matter of months. This service interval must be determined by the user.

Where abnormal conditions, such as salt deposits, cement dust or acid fumes prevail, clean the insulators in order to avoid flashover which might result from the accumulation of foreign substances.

Examine the contacts. Check to determine that they are aligned and that contact surfaces bear with a firm uniform pressure. Check contact surfaces. If it is known that the switch carried a heavy short-circuit current, special effort should be made to inspect the switch at the earliest possible time. This is especially important if the switch contacts are badly corroded since the ability of the switch to carry rated short-circuit currents is seriously impaired if the contacts are not properly maintained. Replace any pitted or burned contacts. If pitting is of a minor nature, smooth down the surface of the contacts with clean fine sandpaper (not emery), then apply a coating of NO-OX-ID (Grade A

Special) lubricant. (NO-OX-ID greases can be purchased from the Dearborn Chemical Co., 310 South Michigan Avenue, Chicago, Illinois.)

See that bolts, nuts, washers, cotter pins and terminal connections are in place and tight. Check for the simultaneous closing of all blades and for complete contact in the closed position.

Where periodic maintenance of any kind cannot be made, it should be recognized that the life of the switch contacts may be affected. In these cases, when a switch operation is made, it is recommended that the switch be opened and closed several times instead of just once in order to clean the contacts more effectively.

In general, the linkages of the OPERATING MECHANISM will not require maintenance. All the BEARINGS located at vital points are weather-sealed and greaseless. Exposed BEARINGS should be given special attention where atmospheric contamination is abnormally high or operation under sleet conditions is common. Dow Corning DC-4 silicone compound is recommended for lubricating these BEARINGS.

ORDERING INFORMATION

In ordering parts or in correspondence regarding this equipment, contact nearest I-T-E Sales Office and state the voltage, current rating, type and the serial number as indicated on the switch name plate.



3 ADJUST BLADE AND JAW

After aligning the INSULATOR STACKS, close the switch by hand and check that the BLADE MOVING CONTACT (A) properly engages the JAW CONTACT (B), Fig. 4. Proper contact means:

- a. The BLADE MOVING CONTACT STOP must come to rest on the JAW CONTACT STOP in order for switch to be fully closed, Fig. 5.
- b. The BLADE MOVING CONTACT surfaces must be parallel to the JAW CONTACT surfaces. This is necessary for line-contact engagement and equal deflection of jaw springs in case of multi-fingered jaws.

If the switch CONTACTS do not engage properly, loosen the two BOLTS in the CLAMP that secures the BLADE. This will permit the BLADE to be rotated, shortened, or lengthened as needed.

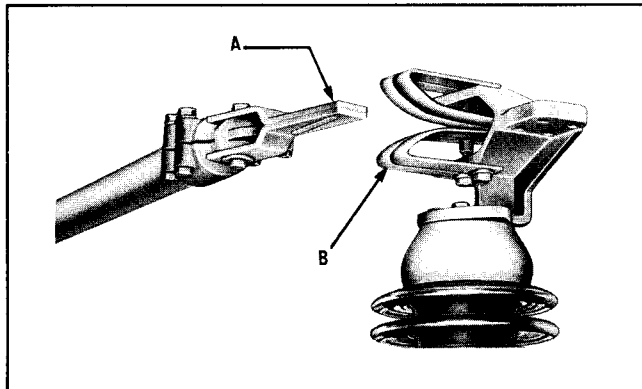


Fig. 4. Blade and jaw contact.

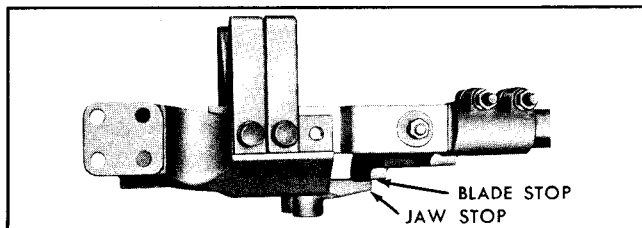


Fig. 5. Plan view of switch blade in fully closed position.

4 SET STOP BOLTS

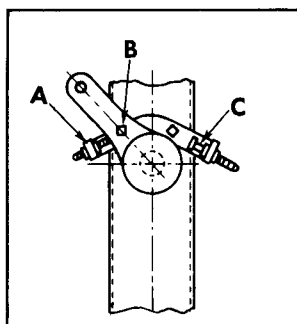


Fig. 6.
Stop bolt adjustment,
3-inch bolt circle.

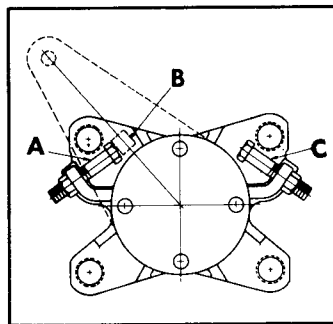
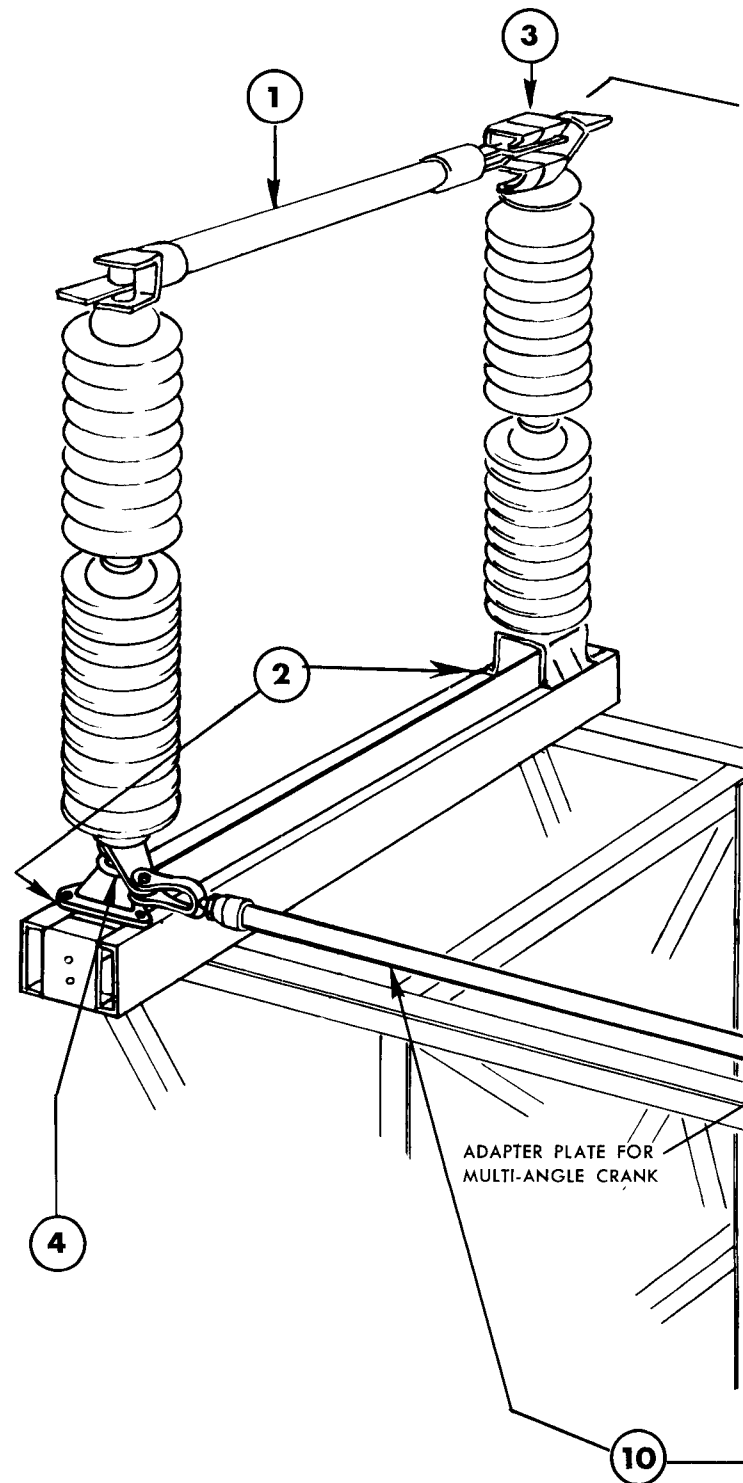


Fig. 7.
Stop bolt adjustment,
5-inch bolt circle.





These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the nearest I-T-E Sales Office.



I-T-E Imperial Corporation

Adjust the STOP BOLTS on the switch ROTOR BEARING as follows:

- a. With the switch in the fully closed position, adjust the CLOSED POSITION BOLT (A) so it engages the mating PROJECTION (B) on the CRANK.
- b. Move the switch to the fully open position and adjust the OPEN STOP BOLT (C) in the same manner.

5 MOUNT SWITCHES

Locate and mount the assembled switches on the structure. See switch operating mechanism drawing for proper location. (Note that the operating pole has the multi-angle crank on the base.)

6 MOUNT OFFSET BASE

Locate and mount the OFFSET BASE and BEARING on the structure in accordance with switch operating mechanism drawing.

7 VERTICAL OPERATING PIPE

Connect the top of the VERTICAL OPERATING PIPE to the shaft of the OFFSET BEARING with one of the $\frac{5}{8}$ -inch diameter pins that is provided. If the VERTICAL OPERATING PIPE is longer than 23 feet, a PIPE SPLICE and GUIDE PLATE are furnished and should be installed as shown on the right, Fig. 10. The PIPE SPLICE is attached to the two pieces of pipe by means of $\frac{5}{8}$ -inch diameter pins. Then, slide the GUIDE PLATE on the VERTICAL OPERATING PIPE and attach to structure, making sure that the VERTICAL OPERATING PIPE is in the proper position to operate freely.

8 INSTALL OPERATOR

Assemble GROUND CLAMP, OPERATOR and LOCK PLATE on the bottom of the VERTICAL OPERATING PIPE. Bolt the LOCK PLATE to the structure, making sure the OPERATING PIPE is not binding at any of the bearing points.

If the OPERATOR is a swing handle, locate the center line of the operating handle 4 inches above the LOCK PLATE in a position to operate the switch. Clamp the handle on the VERTICAL OPERATING PIPE by slightly tightening the two piercing set screws for trial operations. **Do not pierce the pipe.**

If the OPERATOR is a geared mechanism (Fig. 8) or motor mechanism (Fig. 9), attach it to the vertical operating pipe and structure.

9 CONNECT OFFSET LINK

With all three poles in the closed positions, connect one end of the OFFSET LINK to the MULTI-ANGLE CRANK of the operating switch and the other end to the crank of the OFFSET BEARING. Manually operate the switch using the operator supplied. Adjust the OFFSET LINK as needed to obtain proper operations of the switch. After this test operation, leave the switch in the closed position.

10 CONNECT INTERPHASE LINKS

Connect one INTERPHASE LINK between the operating single pole switch and the switch on the next phase. Using the MANUAL OPERATOR, adjust the INTERPHASE LINK as needed to obtain proper operation of both poles. Connect the other INTERPHASE LINK between the operating switch and the remaining switch. Again use the MANUAL OPERATOR, and adjust the INTERPHASE LINK as needed to obtain proper operation of the three switches.

11 ADJUST SWING HANDLE OPERATOR

If the OPERATOR is a swing handle type:

- a. Relocate the HANDLE, if necessary, so that it can rotate downward and engage the STOPS on the LOCK PLATE in both the open and closed positions.
- b. Secure the HANDLE to the VERTICAL OPERATING PIPE by piercing the pipe with the set screws.
- c. Locate and assemble the LOCK PLATE STOPS so they provide the same residual (pipe wind-up) torque in the VERTICAL OPERATING PIPE when the HANDLE is engaged with the STOPS. Check the wording on the LOCK PLATE STOPS to see that it is appropriate for the open and closed positions.

12 INSTALL GROUND STRAP

Clean the VERTICAL OPERATING PIPE and apply a corrosion-resistant grease on the spot where the GROUND CLAMP is to be attached. Attach the GROUND CLAMP so the GROUND STRAP is not stretched tight when the HANDLE is moved to either the open or closed positions.

13 INSTALL INTERLOCKS

If KIRK KEY INTERLOCKS or other mechanical INTERLOCKS are to be used, install them in accordance with the instructions supplied with the INTERLOCK.

14 MAKE FINAL CHECK

Check to see that:

- a. All BOLTS are tight and all COTTER PINS are bent adequately.
- b. The single poles are held against their individual ROTOR BEARING STOPS in both the open and closed positions.
- c. The VERTICAL OPERATING PIPE has residual torque in both positions.
- d. The operating effort required to operate the switch is not excessive.

15 ACCESSORIES

When Arc Restrictors are supplied with the switch, attach and adjust in accordance with the instruction tag wired to the switch.

