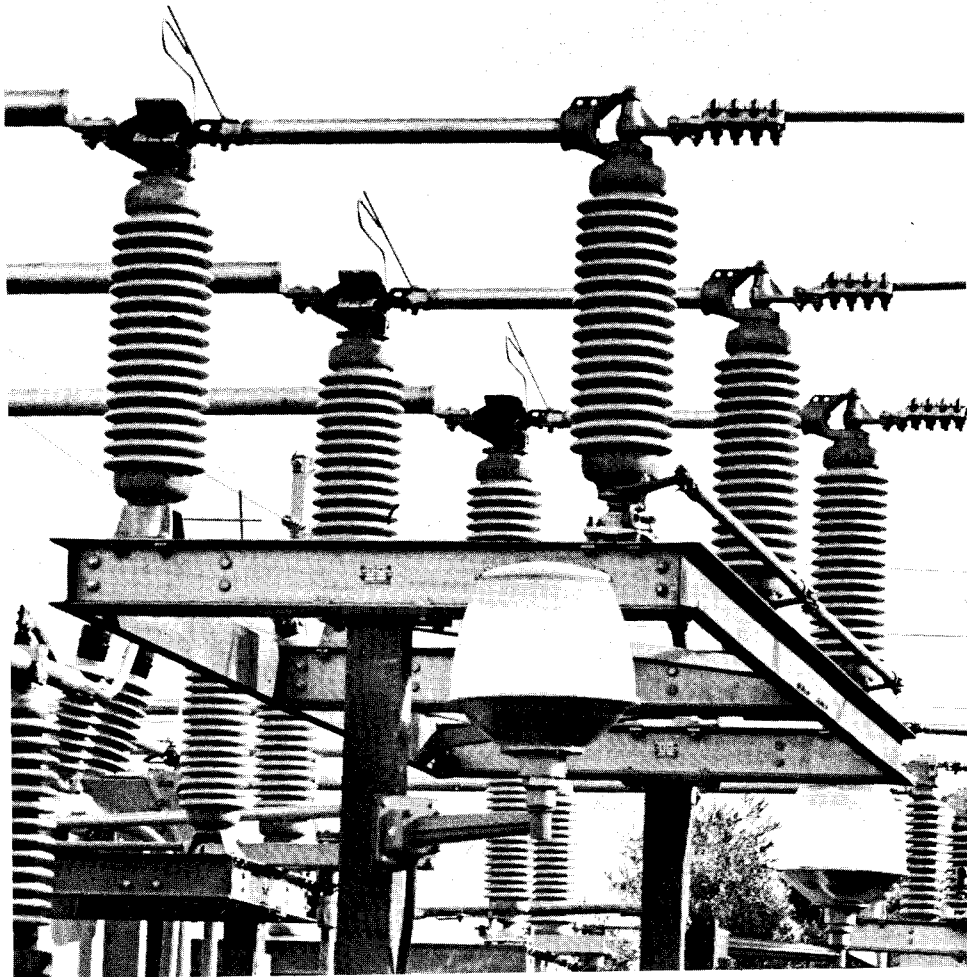


GOULD I-T-E AIR SWITCHES — OUTDOOR
INSTRUCTIONS

A7A SIDE-BREAK SWITCHES
7.2 THRU 138 KV NOMINAL
8.25 THRU 145 KV MAX. DESIGN



IMPORTANT

Make absolutely sure applicable equipment is de-energized and properly grounded before proceeding with any installation or maintenance.

INSTRUCTIONS FOR 7.2-THRU 138-KV

A7A SIDE-BREAK SWITCHES

GENERAL

This manual provides instructions for the installation and maintenance of A7A 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 shipping notice, bill of material and installation drawings. Report any shortages or damages immediately to the carrier and file proper claim. The shipping notice (designated S/N) identifies the numbered crate or carton in which the various items of the bill of material are to be found. Typical example: The bill of material drawing covering complete switch and control parts might list Item 15 as a ground clamp. The shipping notice should then list Item 15 and its drawing number as being included in some carton number such as 1252-54. Similarly, all other parts of the switch and controls will be identified and designated as being in certain numbered cartons, crates or bundles.

INSTALLATION AND ADJUSTMENT

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.

Step 1 - Assemble Switches

If the switches are not assembled, assemble the insulator stacks to switch base. 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.

Step 2 - Insulator Stack Alignment

The insulator stacks can be aligned by placing open-end shims, Fig. 1, under the insulator supports (spacer or rotor bearing) where the bolts secure them to the switch base. The rotating insulator stack can also be aligned with adjusting nuts or leveling screws, Figs. 2 and 3, if supplied (only when specified).

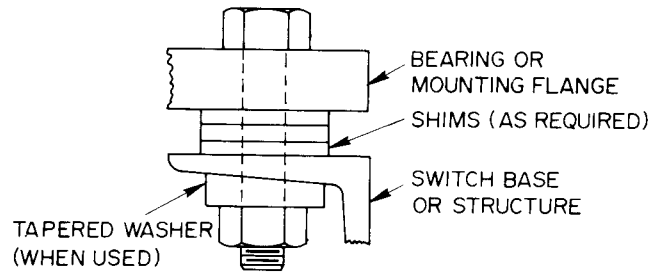


Fig. 1 Shims used for leveling switches

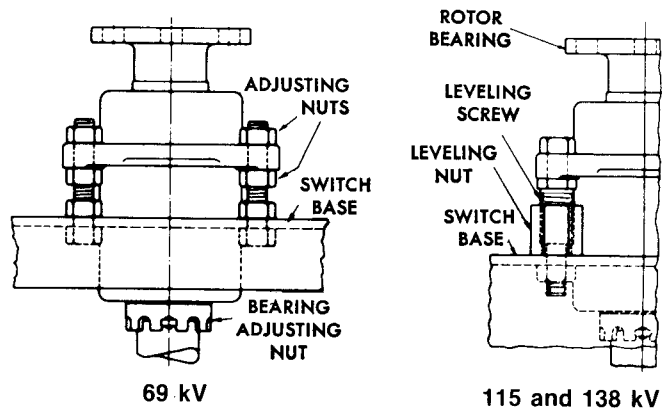


Fig. 2 Leveling detail, 3-inch bolt circle.

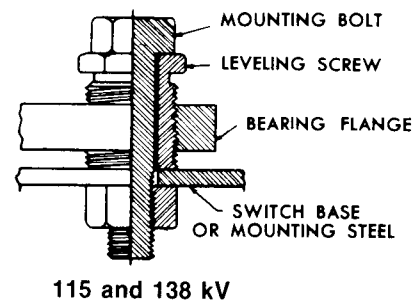


Fig. 3 Leveling detail, 5-inch bolt circle.

Step 3 - Adjust Blade and Jaw

Blade and jaw contacts should be coated with a lubricant before adjusting. Suggested lubricants are DARINA 2 or NO-OX-ID "A Special."

After aligning the insulator stacks, close the switch by hand to see if blade contact (A) properly engages jaw contact (B), Fig. 4.

The blade contact should enter the jaw contact centrally, and engage deep enough so that the blade stop either touches or is within $\frac{1}{2}$ " of touching the jaw stop, Fig. 5.

It may be necessary to re-adjust insulator stacks to achieve proper contact engagement.

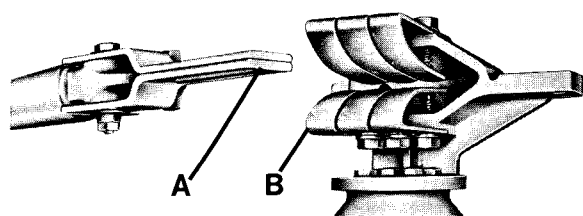


Fig. 4 Blade and jaw contact

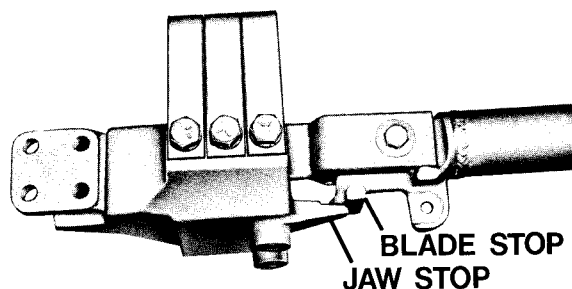


Fig. 5 Plan view of switch blade in fully closed position

Step 4 - Set Stop Bolts

Adjust the stop bolts on the switch rotor bearing as follows:

- With the switch in the fully closed position, adjust the closed position bolt (A) so it engages the mating projection (B) on the crank.
- Move the switch to the fully open position and adjust the open stop bolt (C) in the same manner.

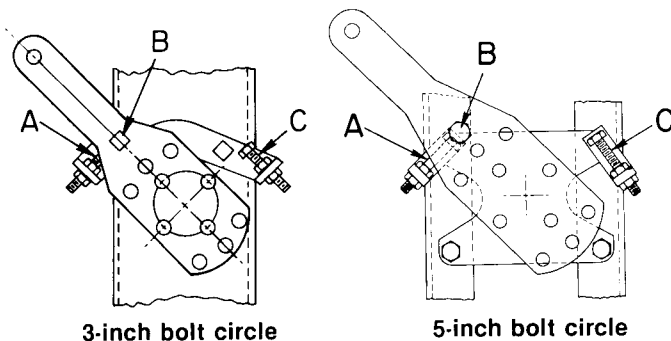


Fig. 6 Stop bolt adjustment

Step 5 - Mounting Switches

Locate and mount the assembled switches on the structure. See switch operating mechanism drawing for proper location. Make sure multi-angle adjustable crank is attached to the operating pole.

Step 6 - Mounting Offset Base

Locate and mount the offset base and bearing on the structure in accordance with switch operating mechanism drawing.

Step 7 - Installing Interphase and Offset Rods

With all blades in the full open position, install the interphase rods as follows:

- Adjust the interphase rods that are in compression during closing to be as long as possible while allowing the pins to be inserted.
- Adjust the interphase rods that are in tension during closing to be as short as possible while allowing the pins to be inserted.
- The adjustment of the offset rod between the offset bearing and the driven switch should be made in the same manner.

Step 8 - Installing Vertical Operating Pipe

Connect the top of the vertical operating pipe to the shaft of the offset bearing (or on the pole unit rotor bearing in case of direct connected switches) with the coupling and $\frac{5}{8}$ " diameter pin supplied in a bag.

The vertical operating pipe is pre-drilled at the end that goes over the rotor shaft of the offset bearing or switch bearing. At this point, check the drawings supplied for accessory equipment (auxiliary switches, mechanical interlocks, position indicators, ground straps, etc.) that mounts on the vertical operating pipe and install before the operating mechanism.

When the length of the vertical operating pipe exceeds 23 feet, a pipe splice and guide plate are furnished and should be installed as shown. The pipe splice and both pieces of pipe are pre-drilled to receive the $\frac{5}{8}$ " diameter pins. The guide plate should not be solidly mounted until after the vertical pipe has been completely installed; then bolts holding the guide plate on the structure should be tightened in order that the hole in the guide plate lines up with the normal position of the pipe so there is no binding.

Step 9 - Installing Operating Mechanism

A swing handle operator or worm gear mechanism is normally supplied for manual operation.

Swing handle operator — To install the swing handle operator, Fig. 10, slide the handle and lock plate over the end of the vertical operating pipe and fasten the lock plate at the proper location. The recommended height for the lock plate is 3'6" above ground. The lock plate consists of two castings mounted on a pipe guide plate. They can be adjusted in an arc to give the required rotation of the vertical operating pipe and also reversed to show proper position indication.

TERMINAL CONNECTIONS

Because of the wide acceptance and use of aluminum conductors, the terminal surfaces are aluminum to provide an easy current transfer surface. (In cases where copper conductor is used, it is recommended that a tinned terminal clamp be bolted to the aluminum switch terminal pad.) However, if a non-tinned clamp is used, a liberal amount of grease should be used at the joint and all over the pad of the fitting.

An instruction tag is attached to the terminal clamps shipped with the switches for making aluminum connections as follows: (1) Clean all contact surfaces of conductors and fittings with a stiff wire brush to remove heavy oxide coatings until they become a typical fresh aluminum color. (2) Immediately coat these contact areas with a liberal amount of corrosion inhibitor such as NO-OX-ID "A Special" or equivalent. (3) Abrade the contact surface again, this time through the applied compound with a stiff wire brush. (4) Make connections and tighten bolts.

CAUTION - Do not remove the compound.

In making copper-to-aluminum connections: (1) Prepare all aluminum contact surfaces as described above. (2) Prepare any bare copper surfaces in the usual manner. (3) Do not abrade or wire brush any plated surfaces; a few light rubs with fine steel wool before greasing is sufficient. (4) Make connections and tighten bolts.

RECOMMENDED TORQUE FOR ALUMINUM BOLTS

Bolt Diameter, Inches	Lubricated Threads		Dry Threads	
	In. - Lbs.	Ft. - Lbs.	In. - Lbs.	Ft. - Lbs.
1/2	240	20	420	35
5/8	480	40	720	60
3/4	720	60	1140	95

ORDERING INFORMATION

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

MAINTENANCE

A certain amount of care and inspection is recommended. The frequency of inspection depends on the atmospheric conditions at a given switch location and the frequency of operation. This service interval must be determined by the user. **Before servicing the switch, be sure it is disconnected from all electric power sources and is properly grounded.** Recommended maintenance is similar to that listed in the latest industry standards. First, it is important that the insulators are always clean. It is also important that the contacts be examined to see that they are aligned, clean, and bear with a firm uniform pressure. If the contacts are pitted, or burned to some extent, they should be removed and replaced.

Under normal service conditions, the jaw contacts should be examined and maintained at least once a year, depending upon the type of atmosphere to which they are exposed.

Periodic maintenance should consist of cleaning the contact surfaces thoroughly by carefully scraping off any contamination or deposit and sanding the surface to a smooth finish with clean fine emery or sand paper being careful to wipe off evidence of sand. With the contact surfaces entirely clean, a coating of lubricant should be applied. Suggested lubricants are DARINA 2 grease or NO-OX-ID "A Special". DARINA 2 is a Shell Oil Company product. NO-OX-ID is made by Dearborn Chemical Division of W. R. Grace & Co.

In general, operating linkages require virtually no maintenance. However, in contaminated atmospheres or where operation under sleet conditions is common, some lubrication at pivot points may be desirable. The grease used should be durable even when exposed to the elements, and should retain its viscosity over a wide temperature range.

Also refer to ANSI C37.35 (American National Standard Guide for the Application, Installation, Operation and Maintenance of High-Voltage Air Disconnecting and Interrupter Switches).

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 Gould Inc.



The plate acts as a lock for the manual operating handle when it is dropped from operating position, see Fig. 7. The handle must be raised to the horizontal position for operation.

The lower end of the vertical operating pipe should extend through the lock plate at least 3 inches (and may extend as much as 3 feet or more — just so it does not touch the ground or column footing).

With the switch in the fully closed position, move the operating handle one-half the full angular travel (see control drawing) of the vertical operating pipe toward the closed position as measured from the lock plate centerline, see Fig. 7. With the centerline of the handle clamp 4 inches above the lock plate and at the position described above, tighten the set screws that fasten the handle clamp to the vertical operating pipe. They should be tightened until holes are pierced in the pipe. Then adjust the closed position stop on the lock plate until it exerts a pressure against the operating handle. Open the switch with the operating handle and adjust the open position stop until it exerts a pressure against the operating handle. This provides a slight torsional wind up in the vertical operating pipe. The handle, lowered to the locked position, is 3 feet long but when in the operating position may telescope to 5 feet if required.

Manual worm gear mechanism — With the vertical operating pipe attached to the shaft of the offset bearing and with the accessory equipment mounted to the vertical operating pipe, the worm gear mechanism, Fig. 8, can now be installed if it is the operator supplied. Before installing, remove the small position indicators which are attached to the worm gear coupling with Allen set screws. With the ground strap in place on the vertical operating pipe, mount the worm gear mechanism and tighten square head set screws in coupling until pipe is pierced.

The three-pole switch should now be operated manually and checked for proper adjustment. If all stops at switch elevation, including the offset bearing, have been set then it is safe to re-install the position indicators on the worm gear mechanism. These indicators should not quite touch the raised boss on the worm gear housing in either the open or closed position.

Motor operator — For remote operation, a motor operator, Fig. 9, is supplied and it should be installed per instructions supplied with it. **CAUTION** - when installing motor operators, be sure the drive motor circuit is de-energized just before the switch and offset bearing stops make contact.

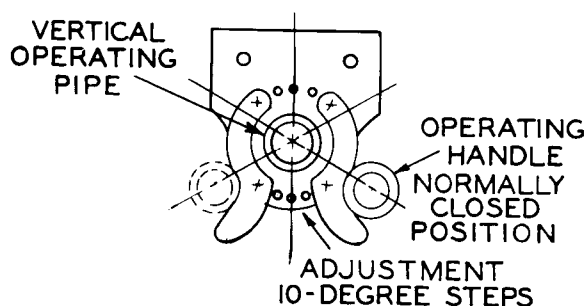


Fig. 7
Operating handle lock plate

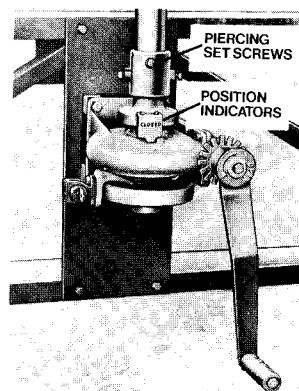


Fig. 8
Geared mechanism

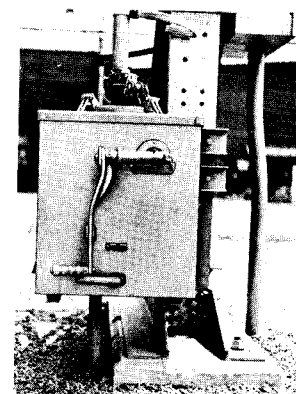


Fig. 9
MO-10 motor operator

Step 10 - Installing Interlocks

If KIRK key interlocks or other mechanical interlocks are to be used, install them in accordance with the instructions supplied.

Step 11 - Arcing Horns or Arc Restrictors

When arcing horns or Arc Restrictors are supplied, they should now be installed and adjusted in accordance with the drawings. The stationary horn is attached to the jaw and should be adjusted, or even bent slightly, to give a light contact pressure between the horn and the switch blade.

Step 12 - Final Checks

Check to see that:

- All bolts are tight and all cotter pins are bent adequately.
- The single poles are held against or nearly against their individual rotor bearing stops in both the open and closed positions and also the stops on the offset bearing.
- The vertical operating pipe has residual torque in both positions.
- The operating effort required to operate the switch is not excessive.

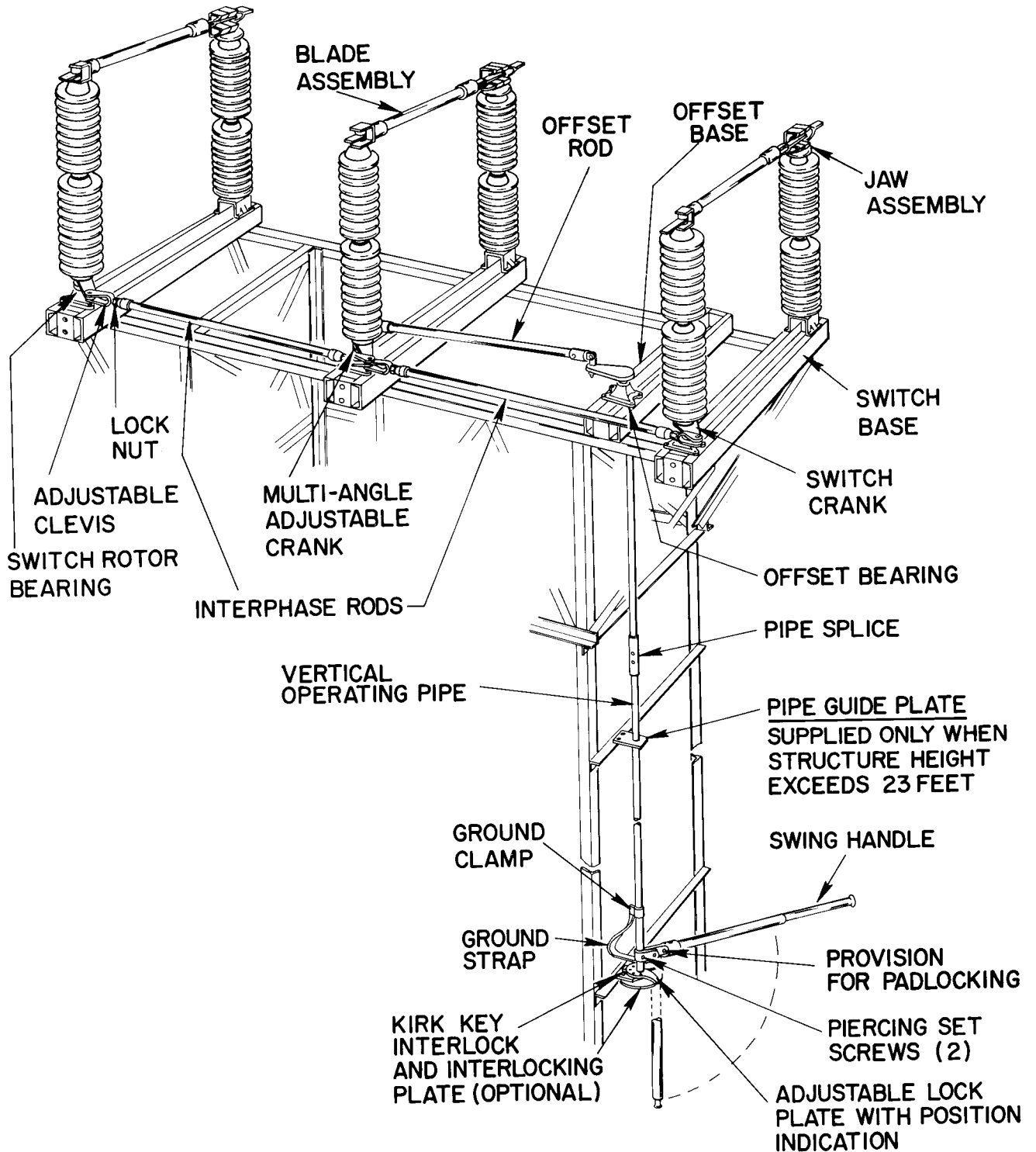


Fig. 10 Typical three-pole A7A switch installation