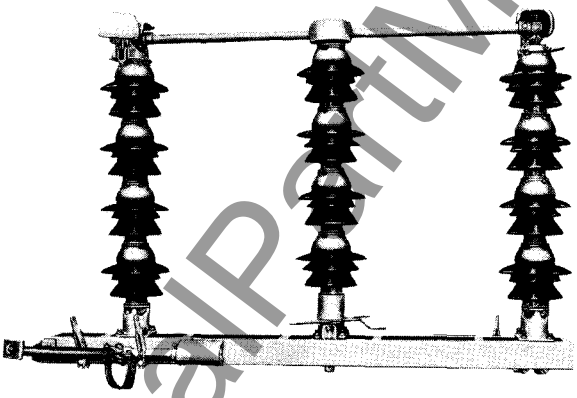
Instruction Manual

for

INSTALLATION AND ADJUSTMENT

TYPES TTT AND TTS AIR SWITCHES

5" BOLT CIRCLE—69H Kv and Above



3105A

161 Kv, 1200 Ampere, Type TTT Air Switch. Double Break, Rotating Blade, Horizontal Opening, shown with Grounding Switch.

I-T-E Imperial Corporation

TYPES TTT & TTS AIR SWITCHES
5-INCH BOLT CIRCLE

Unpacking Inspection

Five-inch bolt circle Types TTT and TTS switches, 69 Kv to 230 Kv, are normally shipped unassembled – base and operating mechanism, insulators, blade mechanism, jaws, and sleet hoods. The bill of material and installation drawings, contained in an envelope, should be checked against the total shipment of switch pole units, operating links and mechanisms for completeness and to aid in the installation procedure. Any damages or shortages should be reported immediately to the carrier and proper claim entered.

Installation Instructions

For all 5-inch bolt circle Types TTT and TTS switch installations, a complete set of drawings showing the assembly arrangement is furnished and should be followed in erection. The component parts for the complete general arrangement are identified and their location clearly shown in these drawings. The following notes are offered to supplement the information given in the drawings.

The individual switch bases are mounted on the supporting structure, after which the insulator columns are assembled. The insulator columns should then be plumbed and checked for parallel alignment and proper spacing. Levelling screws are provided at the base of the insulator columns as a means of obtaining proper alignment. These levelling screws are shown at position "Y", Figures 1 and 2, and the detailed construction of the levelling screws is shown in Figure 3. Referring to Figure 3, this adjustment may be made by releasing the 5/8-inch mounting bolt and locking nut, and by turning the levelling screw in the desired direction. After the insulator stacks have been brought into alignment, and with each of the levelling screws bearing on the switch base, tighten the locking nuts and the 5/8-inch mounting bolts.

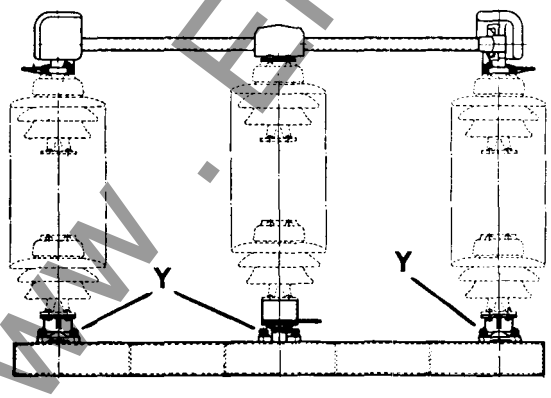


Figure 1. Showing Location of Leveling Screws, Type TTT Switch.

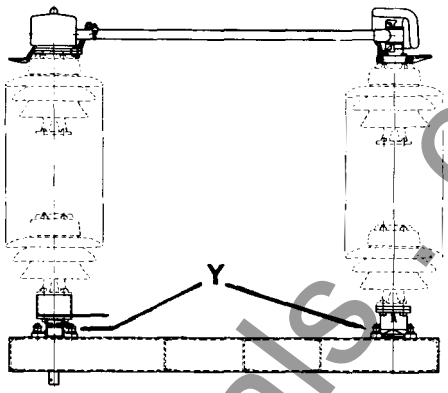


Figure 2. Showing Location of Leveling Screws Type TTS Switch.

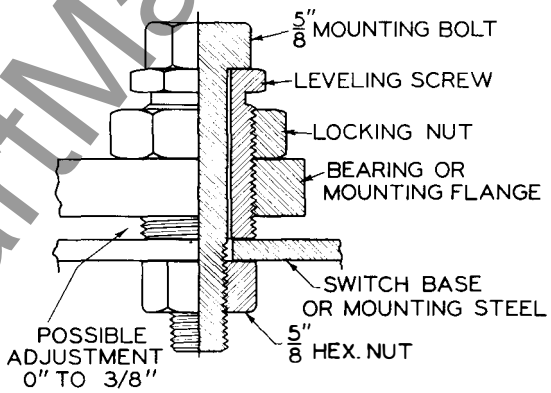


Figure 3. Leveling Screw Detail 5" B. C.

With the bases and insulator columns assembled as described, the current carrying parts should be assembled by attaching the blade mechanism to the rotating insulator column and the jaws to the end insulators of each pole unit with the bolts provided.

After the blade mechanism has been securely fastened to the rotating insulator column, the sleet hoods should be assembled to protect the mechanism parts.

The operating or control mechanism should be erected in accordance with the installation drawings. This can be done either during the assembly of the switch pole units on the structure or immediately thereafter. With the switch pole units mounted on the structure and the operating mechanism installed in accordance with the installation drawings, final adjustment of the individual pole units and the group operated 3-pole assembly may be made as follows.

Adjustment

In the case of a direct operating mechanism, the vertical operating pipe is coupled directly to the rotor of one of the switch pole units. For an offset mechanism, the vertical operating pipe is coupled to an offset or fourth bearing. In the latter case, an offset link is provided to connect the outboard bearing to one of the switch pole units.

Starting with the switch pole unit that is either directly coupled to the vertical operating pipe or connected to the vertical operating pipe with an offset link, slowly rotate the blade toward the jaws, and check whether or not the blade contacts or beaver tails make central entry between the jaw contact members. If they do not, the levelling screws found at the base of the center insulator column may be adjusted so as to permit central entry.

Continue rotating the blade toward the closed position until the blade axis is parallel to the base axis. In this position, the blade of the TTT switch should make contact with both jaw stops, and the blade on the TTS switch will make contact with its stop. The blade will then rotate along its longitudinal axis to make full engagement between the blade beaver tails and their cooperating jaws. Rotation of the blade along its longitudinal axis is stopped when the blade beaver tails are perpendicular to the jaw contacts, Figure 4.

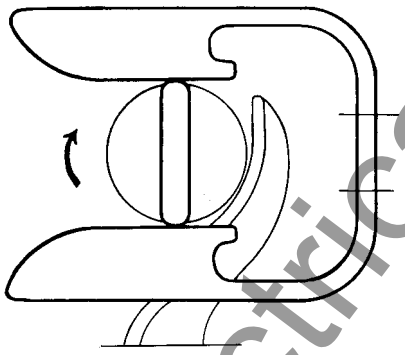


Figure 4. Showing Blade in Full Engagement.

The jaw and blade contact surfaces should engage in parallel alignment, each contact finger making line contact on the blade beaver tail as shown in Figure 5. If necessary to improve this alignment, loosen the bolts which retain the U-shaped jaw contacts to the jaw base casting, thus permitting the contact fingers to align themselves on the blade beaver tail. Then tighten the retaining bolts.

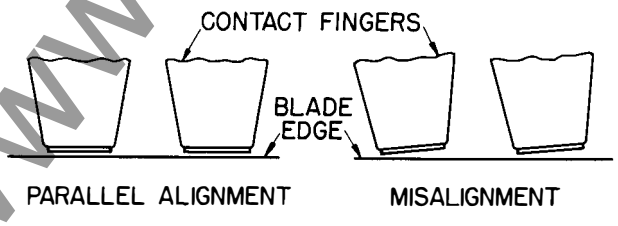


Figure 5. Proper Alignment of Fingers.

With the blade beaver tails perpendicular to the jaw contacts, the closed position stops at the rotor bearing, Figure 6, should be set. Likewise, the closed position stop of the operating mechanism located at ground elevation should be set. With this setting accomplished, the blade may be moved through the operating mechanism to the open position, 75 degrees from the centerline of the switch base. The open position stops should then be set for both the rotor bearing at switch elevation and the operating mechanism at ground elevation.

Operate this one pole unit several times with the operating mechanism to the fully open and fully closed positions, making any necessary final adjustments. Leave this switch pole unit in the fully closed position.

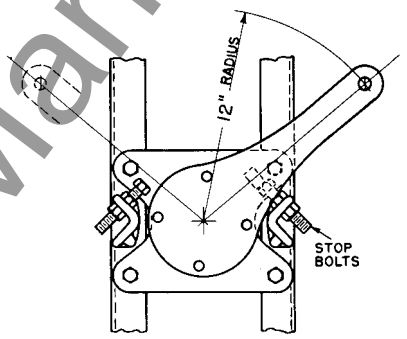


Figure 6. Showing Stop Bolt Adjustment.

Manually close one of the adjacent pole units, making adjustments as required and as described for the driven pole, after which this second pole may be coupled to the driven pole unit by installing the interphase connecting rod. Partially open these two pole units by using the operating mechanism and then reclose to be sure the two blades travel in unison and arrive at the fully closed position simultaneously. It may be necessary to lengthen or shorten the interphase connecting rod with the screw thread adjustment provided to obtain this condition. The closed position stop bolt for the second pole unit should then be set and the two pole units operated to the switch open position for setting the open position stop of the second pole unit.

Using the operating mechanism, return the two pole units to the closed position, and repeat the above procedure for the third pole unit to complete the 3-pole, group-operated switch installation.

Operate the 3-pole switch several times as a final check that all adjustments are proper. Be sure all blades operate to the fully closed position when the operating mechanism at ground elevation is in its closed position.

TYPE TTS

Type TTS switch is commonly used as a double inverted breaker disconnect, Figure 7. Two switches are mounted on a common base, normally supplied with individual operating mechanisms for each 3-pole switch. The adjustment of the double inverted TTS disconnect switch is the same as previously described in this bulletin.

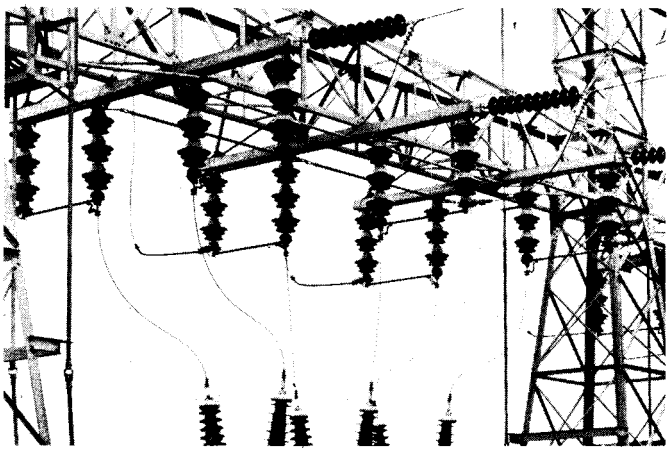


Figure 7 3121C

TYPE TTT

The Type TTT, double break, rotating blade switch is very often used as a bus tie disconnect, Figure 8.

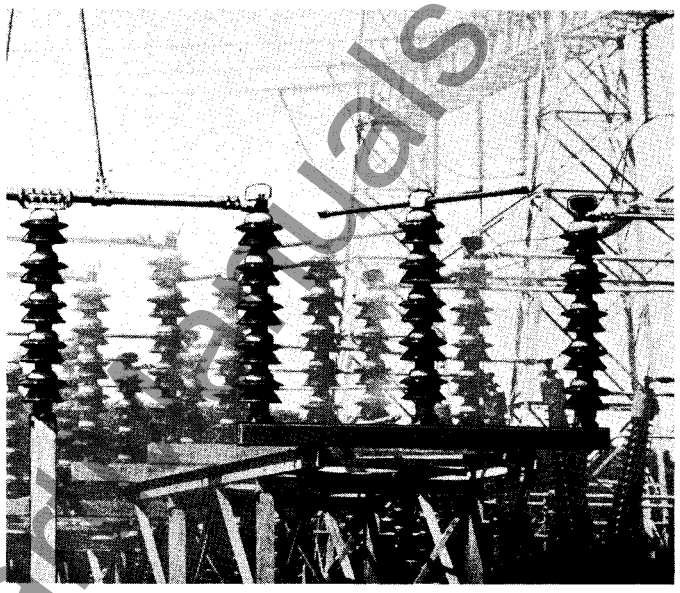


Figure 8 3796G

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5C-1069S