DESCRIPTION • OPERATION • MAINTENANCE

INSTRUCTIONS

INTERNAL OPERATING MECHANISM AND WSB-1 TAP CHANGER

THE INTERNAL OPERATING MECHANISM permits operation of Type WSB-1 tap changers through a pipe plug opening in the transformer case or cover. It is operated by means of a special wrench. The tap changer must be on position before the wrench can be removed and the pipe plug replaced. This reduces the possibility of accidentally leaving the tap changer between positions. One complete revolution of the wrench is required to change from one tap position to the next. A Geneva-gear driven position indicator is an integral part of the mechanism.

One operating wrench is supplied for each order for one or more network transformers.

THE TYPE WSB-1 TAP CHANGER provides an adequate and convenient method for changing transformer tap connections from outside the transformer case. The tap changer is mounted under oil in the transformer case and is intended for operation only when the transformer is disconnected from the line.

IMPORTANT. No-load tap changers must not be operated with the transformer energized; the transformer must not be energized unless the tap changer is locked on an operating position (see transformer nameplate).

The Type WSB-1 Tap Changers are made to meet voltage and current requirements. When more than one tap changer deck is operated from a single mechanism, the individual decks are mounted axially with a polyester glass shaft passing through each deck. The stationary contacts, with provision on the opposite end for connecting the leads, are through type studs mounted in a thermoset plastic base, and are arranged on a radius equal to that of the moving contacts. Good connections are assured by silver plated wiping contact surfaces, and by either high pressure indentation or swaging of the stud onto the tap leads. See Fig. 1.

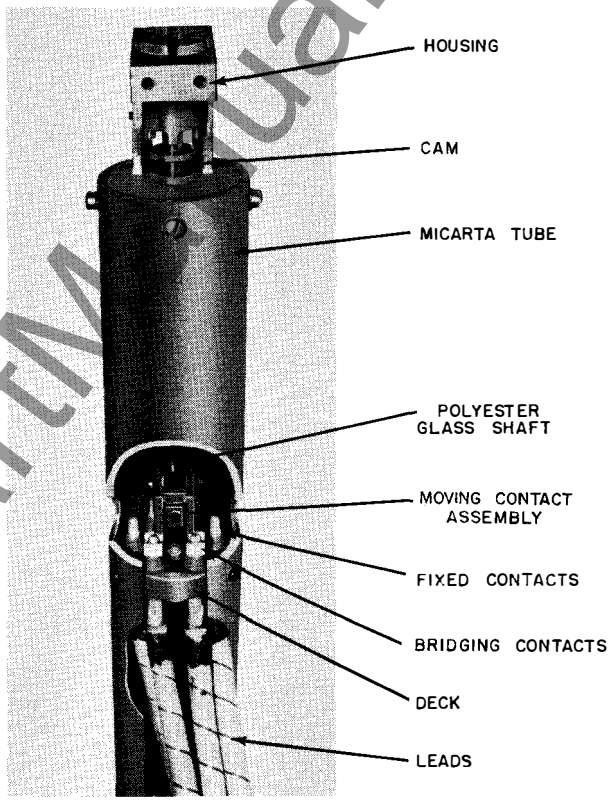

FIG. 1. Cutaway View of Single Deck, WSB-1 Tap Changer

INSTALLATION

The external operating mechanism is connected to the tap changer drive shaft through a flexible shaft and slip joint. This arrangement permits tank expansion and slight shaft misalignment without hindrance to operation. When a tap changer or external operating mechanism is installed in the field, a check of the slip joint for free operation should be made (see Fig. 3).

OPERATION

After removing the pipe plug, the special wrench is inserted with its flat side adjacent to the posi-

tion indicator. The wrench is then turned one complete revolution for each tap position change until the desired position is reached. The tap changer may be turned in either direction from any position. Available voltages and the respective tap changer positions are shown on the transformer diagram instruction plate. These tap changer mechanisms have more positions than available voltages. No damage can result from accidental operation on a position not shown on the instruction plate. No attempt should be made to operate the tap changer with any tool other than the special wrench provided. After removing the wrench, vaseline should be applied to the pipe plug threads and the plug should be screwed tightly into place.

Motion of the tap changer operating handle is transmitted through the flexible shaft assembly to the ninety degree Geneva gearing in the internal tap changer housing. This gearing provides the motion which lifts the moving contacts and rotates them to a new tap position. Cam action in the gearing maintains a closed circuit condition through thirty degrees rotation of the operating shaft, thus eliminating the need for extreme accuracy in pinning the handle to the operating shaft in cases of field assembly. A pin and slot locking arrangement in the tap changer mechanism locks the polyester glass shaft against rotation, except when the contacts are lifted to change position.

Silver-plated copper bridging contacts which move around the circle of fixed contacts provide a connection between any two adjacent contact points. The bridging contacts are spring loaded and supported from an overhead assembly. This assembly is attached to the polyester glass shaft which passes through the center of each deck.

As indicated in Fig. 2 all leads of the WSB-1 tap changer are connected regardless of the number of taps for the transformer. This assures that no damage will result from accidental operation on positions not shown on the transformer nameplate.

This arrangement is necessary because the studs are molded into the deck.

Position "OFF" is indicated on the operating mechanisms, but is not used as a tap position on the tap changer. Accidental operation on position "OFF" will produce a voltage corresponding to one of the other tap positions, and will give an unbalance of the two legs of the transformer winding. This unbalance may affect the impedance or magnetic forces, but would not be detrimental to the transformer.

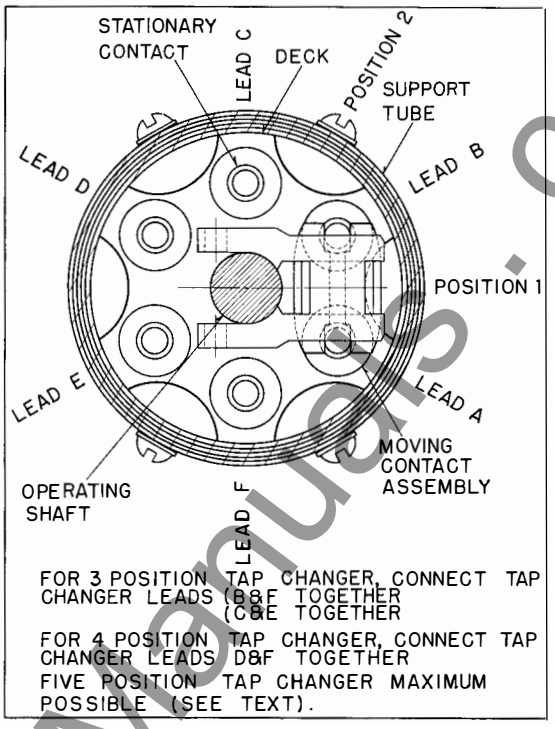

FIG. 2. Connection Diagram for the WSB-1 Tap Changer

MAINTENANCE

The pipe plug should be checked for tightness periodically and tightened when necessary.

The mechanism is designed to operate without maintenance. In case of breakdown, it will be necessary to remove a transformer handhole cover or perhaps the main cover in order to replace broken parts.

If for any reason it is necessary to disconnect the operating mechanism from the tap changer, care should be taken to see that the position indicated on the mechanism indicator corresponds to the position indicated on the tap changer housing when reassembling.

The WSB-1 Tap Changer is designed to operate without maintenance; therefore provision for dismantling is not made. Unit replacement is recommended in case of breakdown.

If replacement of a tap changer or a high voltage coil is necessary, the connection should be made by cutting the tap leads adjacent to the tap changer and brazing the leads from the new tap changer at this point. The replacement tap changer leads are marked from A to F, and may be identified with each tap changer position as shown in Fig. 2. Corresponding winding taps are indicated on the transformer nameplate.

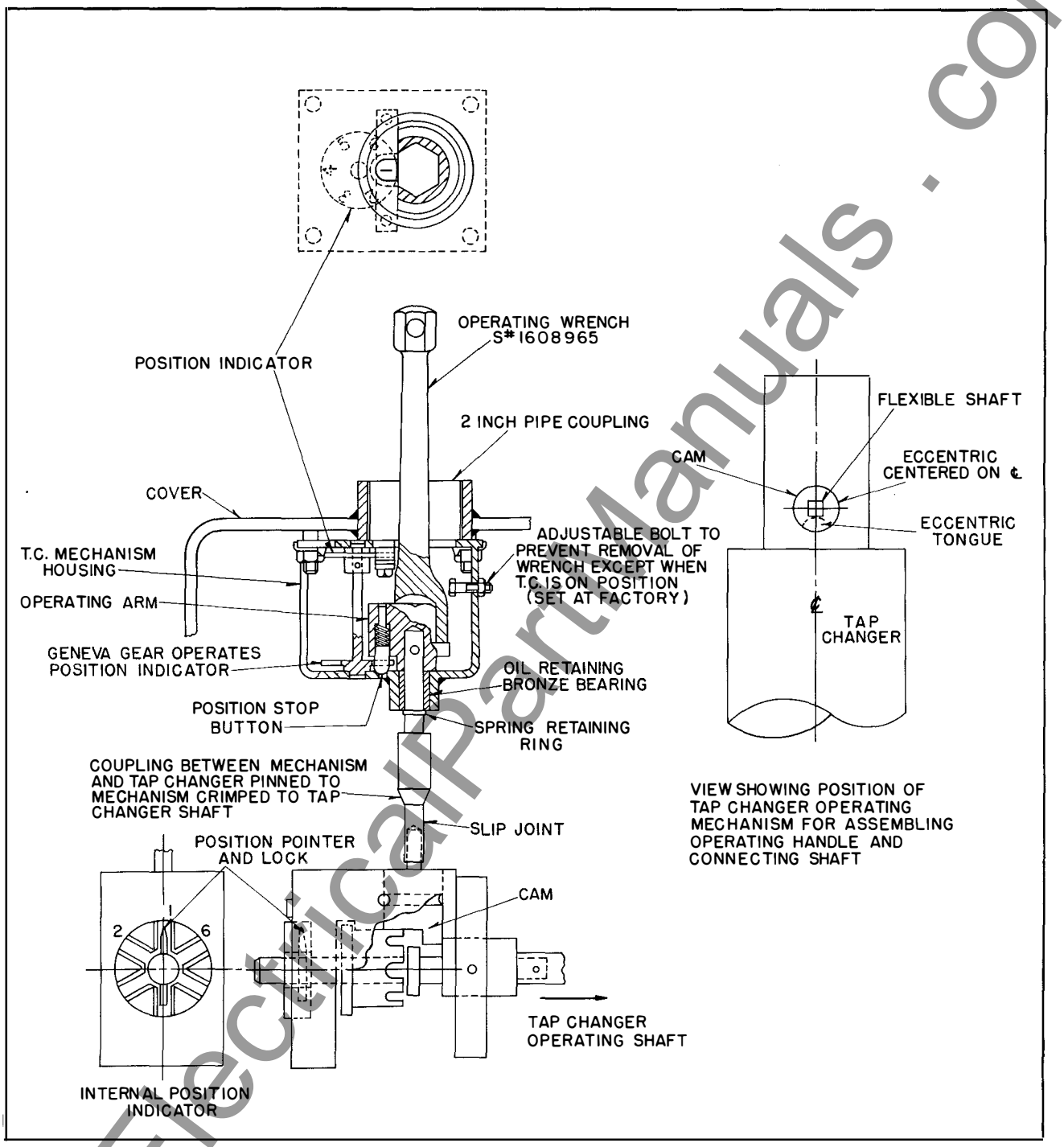

FIG. 3. Outline of Type WSB-1 No-Load Tap Changer with Operating Mechanisms Mounted under Pipe Plug on Cover. (Looking Down, Internal Position Indicator is on Position One)

RENEWAL PARTS

Order renewal parts from the nearest Westinghouse office. Include a complete description of the part wanted along with the data on the nameplate attached to the transformer tank wall.

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