DESCRIPTION • MAINTENANCE

INSTRUCTIONS

TYPES "S" AND "OS" CONDENSER BUSHINGS

With Power Factor Testing Terminal

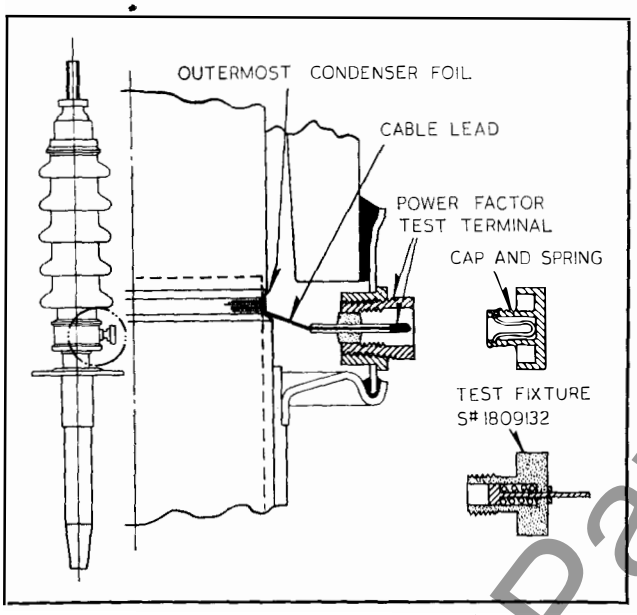

FIG. 1. Bushing Showing Power Factor Test Terminal.

SOME TYPES "S" AND "OS" condenser bushings for transformers are now supplied with a power factor testing terminal as shown in Fig. 1, above. With this device the customer can take power factor measurements by the "Ungrounded Specimen" method shown in Fig. 2. This method is used with a wattmeter or power factor bridge equipped with a ground guard circuit and makes it unnecessary to remove the bushing from the transformer or to disconnect the bushing from the transformer winding. Also, the bushing terminal cap, which seals the top end of cable-type bushings does not have to be loosened to make this test.

DESCRIPTION

The power factor test terminal consists of an insulator mounted in the flange of the bushing. An insulated lead from the outermost layer of foil in the condenser is brought through a metal tube in the terminal and soldered at the outer end to make it accessible for tests. A cap and spring assembly which mounts on the test terminal provides the ground connection for the lead during normal operation of the bushing.

POWER FACTOR MEASUREMENT

To measure the power factor of the bushing, remove the cap and spring from the testing terminal. The outermost layer of the condenser is then insulated from the grounded flange by means of the insulator in the terminal assembly. The terminal should be connected to the ground shield of the test set and the flange to ground. A testing fixture (Style #1809 132) provides a convenient means for making the lead accessible for test clips. It guards against accidental grounding during the test procedure and prevents dangerous mechanical strains on any parts of the terminal. This fixture (identified by Style Number) may be ordered from either the Sharon or the East Pittsburgh plants. Test potential can be applied to the bushing lead and only the losses in the bushing insulation will be recorded by the meter.

Caution: It is extremely important that the cap and spring be reassembled on the power factor test terminal before energizing the bushing.

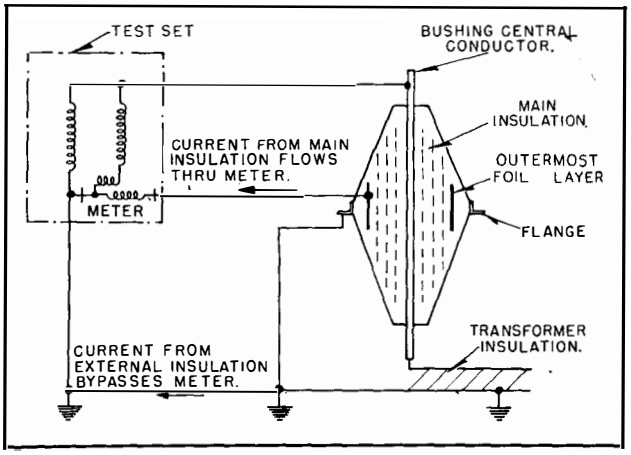

FIG. 2. Connections for Power Factor Testing, Using the "Ungrounded Specimen" Method.

MAINTENANCE

The recommendations for maintenance of bushings equipped with a power factor test terminal are the same as for standard Type "S" bushings.

For detailed instructions, refer to Bushing Manual, Technical Data 33-156.

If the test terminal itself becomes damaged, or the insulator inside the terminal is broken, it is possible to replace the terminal assembly without removing any other part of the bushing.

To replace a testing terminal in the field it is necessary to remove the bushing from the transformer and lay it on its side with the defective terminal uppermost. This will permit removal of the terminal without loss of insulating oil or compound.

To remove the defective terminal the cap and spring assembly must be taken off first. Then sufficient heat to melt the solder on the end of the cable lead should be maintained while the test terminal is turned out of the flange. If the solder is allowed to harden the cable will twist off and make repairs more difficult.

To assemble a new terminal in the flange, apply cement #6499-2 (Style #1608 171) to the threads and fish the lead from the condenser through the tube in the terminal while the terminal body is screwed into place. Solder the end of the cable into the outer end of the tube using rosin core solder. Avoid excess solder on the outside of the tube. Clean rosin flux from the insulator by flushing with benzine. Pressure test can be applied by placing the entire bushing in a 90° C oven for four hours and inspecting for leaks.

Finally assemble the cap and spring assembly to ground the terminal to the flange.

RENEWAL PARTS

To order a new terminal specify power factor testing terminal, and give bushing drawing number, stock order and/or transformer serial number. A complete terminal will be supplied for the particular bushing.

WESTINGHOUSE ELECTRIC CORPORATION
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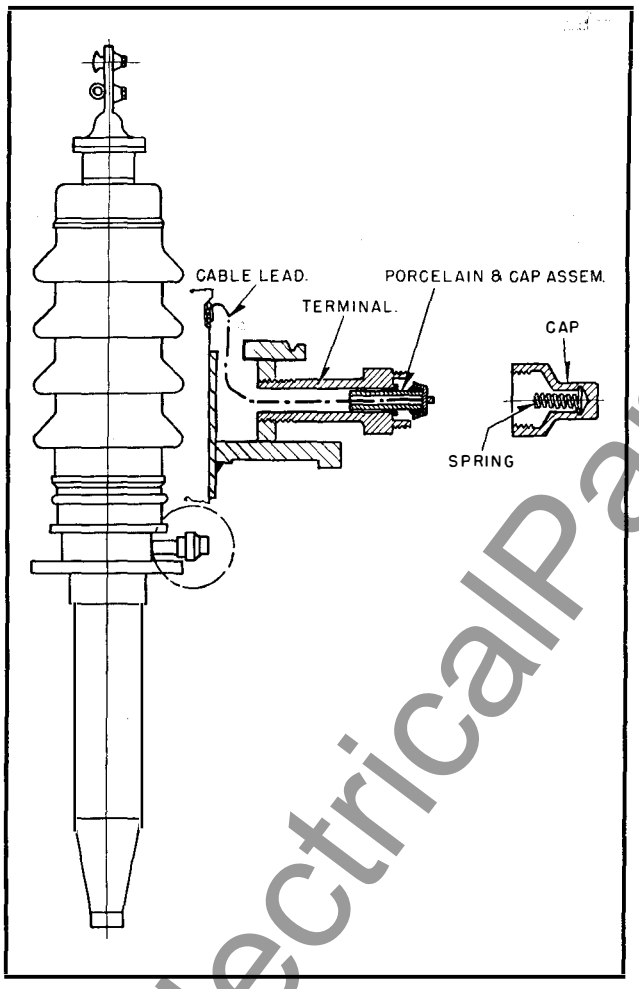

FIG. 1. Bushing Showing Testing Terminal.

SOME TYPES "S" AND "OS" condenser bushings for transformers are now supplied with a power factor testing terminal as shown in Fig. 1, above. With this device the customer can take power factor measurements by the "ungrounded specimen" method shown in Fig. 2. This method is used with a wattmeter or power factor bridge equipped with a ground guard circuit. With this method of test it is not necessary to remove the bushing from the transformer or to disconnect the bushing from the transformer winding. Also, the bushing terminal cap, which seals the top end of cable-type bushings does not have to be loosened to make this test.

DESCRIPTION

This device consists of an insulated terminal mounted in the bushing flange and connected to the ground layer of the condenser by means of an insulated cable. The cable is further insulated from the flange by a porcelain bushing which is "solder-sealed" into the terminal body. The ground layer is connected to the mounting flange of the bushing through the spring and cap on the testing terminal.

POWER FACTOR MEASUREMENT

To measure the power factor of the bushing, remove the cap and spring from the testing terminal. The flange is then insulated from the ground layer by means of the porcelain insulator in the terminal assembly. The terminal should be connected to the ground shield of the test set and the flange to ground. Test potential can then be applied to the bushing lead and only the losses in the bushing insulation will be recorded by the meter.

Caution: It is extremely important that the cap and spring be reassembled on the testing terminal before energizing the bushing.

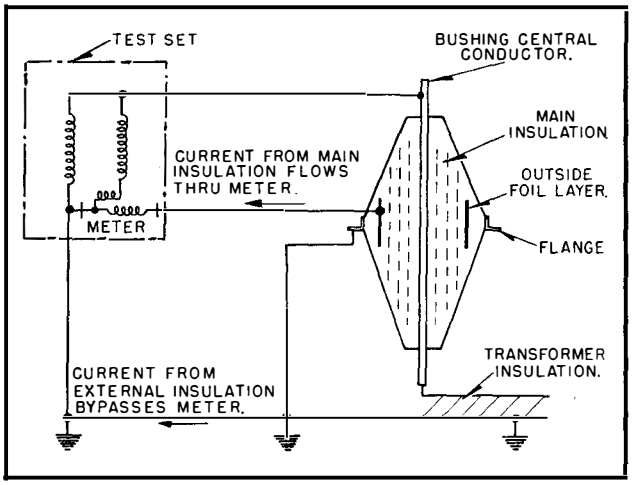

FIG. 2. Connections for Power Factor Testing, Using the "Ungrounded Specimen" Method.

MAINTENANCE

The recommendations for maintenance of bushings equipped with a power factor testing terminal are the same as for standard Type "S" bushings. For detailed instructions, refer to Bushing Manual, Technical Data 33-156.

If the test terminal itself becomes damaged, or the porcelain inside the terminal is broken, it is possible to replace the terminal assembly without removing any other part of the bushing.

To replace a testing terminal in the field it is necessary to remove the bushing from the transformer and lay it on its side with the defective terminal uppermost. This will permit removal of the terminal without loss of insulating oil or compound.

To remove the defective terminal the cap and spring assembly must be taken off first. Next the ground cable must be unsoldered from the porcelain cap before turning the terminal body in the flange.

To assemble a new terminal in the flange, the ground cable should be fished through the porcelain insulator before the terminal body is screwed in place. After the terminal has been screwed into the flange, the cable should be soldered to the porcelain cap. (Care should be taken to protect the cap from being loosened from the porcelain at this time. Wet rags should be wrapped around the solder-sealed area as an added precaution).

Finally, the cap and spring assembly should be screwed on the terminal so as to ground it to the bushing flange.

RENEWAL PARTS

To order a new terminal, specify power factor testing terminal, and give bushing drawing number, stock order and/or transformer serial number. A complete terminal will be supplied for the particular bushing.

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