197- AND SIMILAR TYPE SWITCHES
INSULATION RESISTANCE OF BANKS AND BANK MULTIPLE TESTS

1. GENERAL

1.01 This section covers methods of measuring the insulation resistance of line banks and the associated cabling in step-by-step offices, including community dial offices which employ 197 or similar type switches, and is intended for use where the banks are equipped with silver-plated terminals. The tests are as follows:

(A) Selector Banks and Multiple

(B) Line Finder Banks and Multiple

(C) Connector Banks and Multiple

1.02 When scheduled on a routine basis, a sufficient number of trunks associated with silver-plated terminals should be tested to provide a representative sample. On line finder and connector banks, tests of non-working lines should ordinarily provide a representative sample. In the event that certain of the banks are found to have low insulation resistance, it may be desirable to extend the tests to cover a greater portion or all of the banks having silver-plated terminals. See 1.06.

1.03 Test (A) applies only to selector level trunks that terminate in other selectors in the same building. To facilitate making these measurements, the tests are made from the test jack of the switches at which the trunks terminate and the readings are made while battery and ground are temporarily removed from the trunk.

1.04 Test (B) provides a test for non-working lines in line finder banks. In certain types of community dial offices the line finder and connector banks are permanently associated by cabling in which case Test (B) also provides a test for the connector multiple.

1.05 Test (C) provides a test for non-working lines in connector banks. This test is not required where the line finder banks and connector banks are cabled as covered in 1.04.

1.06 To make equivalent tests of selector trunks which terminate on connectors or outgoing repeaters and also line finder or connector terminals associated with working lines will require temporarily disconnecting any associated equipment from the trunk or line.

1.07 The methods covered herein are based upon the use of the Local Test Cabinet No. 2. However, other facilities of the same general type, which will give equivalent results may be employed if they are more readily available and if the same general testing procedure is followed. Measurements of insulation resistance should, in general, be made before and after dialing a series of pulses on the trunk in order to disclose any changes in insulation resistance that might occur as a result of peak potentials caused by pulsing.

2. APPARATUS

2.01 Local Test Cabinet No. 2 per J94717A (SD-96002-01), or equivalent.

2.02 Dial Hand Test Set D-81763, or equivalent, equipped with a No. 110 plug in place of the No. 240 type plug usually provided.

Note: This modification may be made by one of the following methods:

(a) Replace the existing cord with a No. R2CF cord equipped with a No. 110 plug.

(b) Remove the existing cord tips from the connecting block and insert two cord tips per D-97530 into the connecting block. Equip with a W2W cord having two No. 360 type tools on one end and a No. 110 plug (tip and ring connections) on the other end (2W17A).

2.03 One W2M cord, 9 feet long, equipped with a No. 110 plug on one end and having the two No. 59 cord tips equipped with two No. 90 cord tips (2W12A).

2.04 Five (or six) KS-7105 batteries (22-1/2 volt), or equivalent.

2.05 One R-80209 Tool Tray (Optional).

Test (A) Only

2.06 One W3K cord equipped with a No. 109 plug on one end and a No. 240 plug on the other end. The S and G terminals of the No. 240A plug should be strapped.

2.07 One KS-6320 Orange Stick.

Test (B) Only

2.08 One No. 760 cord.

Tests (B) and (C) Only

2.09 One W2AY cord equipped with a No. 289 plug on one end and having the two No. 59 cord tips equipped with two No. 90 cord tips (2W24A).

3. PREPARATION

3.01 When tests are made on equipment that can be reached from the floor, it may be found convenient to place the local test cabinet on top of a portable test wagon with the test batteries on the lower shelf of the wagon. When the tests require using a ladder, the tool tray listed in 2.05 may be found convenient for holding the test cabinet. Care should be taken in any event to prevent the cabinet from being accidentally dislodged.

3.02 Connect the BAT-G jack of the local test cabinet to the 100 volt test battery using the W2M cord.

Test (A) Only

3.03 Insert the No. 109 plug of the W3K cord in the TST jack of the local test cabinet.

Tests (B) and (C) Only

3.04 Insert the No. 289 plug associated with the W2AY cord in the MF jacks of the local test cabinet. (The stay cord of the plug should be at the bottom.)

Tests (A) and (B) Only

3.05 Insert the 110 plug associated with the dial hand test set in the TLK jack of the local test cabinet.

Tests (A), (B) and (C)

3.06 Operate the (G) key. Momentarily short-circuit the tip and ring of the 240A plug on the W3K cord (or the 59 cord tips associated with the W2M cord) to check the test battery voltage. If the deflection on the meter is outside the limits of 99-101, the connections on the test battery should be changed to another tap to meet this limit. The G key should be left operated.

4. METHOD

(A) Selector Banks and Multiple

4.01 If the switch at which the trunk to be tested terminates is normal, insert the 240A plug of the W3K cord into the test jack.

4.02 Operate the TALK key and dial the digit "0" with the dial on the dial hand test set. This should be done without operating the C button. The switch should step up and restore to normal without cutting in on the level. Dial the digit "0" a second time and note that the switch again releases after pulsing.

4.03 Restore the TALK key. A deflection should now be obtained on the meter equal to the difference between the test battery voltage and the central office voltage.

Note: If the meter is deflected beyond the end of the scale, operate the REV key.

4.04 Momentarily raise the switch shaft off normal with an orange stick. If there is no leakage on the trunk the meter needle will return to zero. (On certain types of community dial equipments, raising the shaft in this manner will not cause the cut through relay to operate, in which case it will be necessary to remove the switch cover and manually operate the cut through relay.) Any deflection on the meter while the shaft is off normal indicates an insulation leak on the trunk. Record the voltmeter deflection if it exceeds 5 volts.

Note: Care should be taken to avoid any body contact with the test plug or switch wiper while a reading is being taken since this might cause a false indication of leakage.

4.05 Remove the 240A plug from the test jack.

(B) Line Finder Banks and Multiple

4.06 At the VIDF (or CDF or the line finder frame) connect to the tip and ring of the first non-working equipped line in the line finder group, as indicated by the absence of a jumper on the associated terminals, using the 59 cord tips associated with the W2AY cord.

4.07 If the needle of the meter is deflected beyond the end of the scale, operate the REV key. The deflection should now be the difference between the test battery voltage and the central office voltage.

4.08 Operate the TALK key and dial the digit "0" twice without operating the C button. Restore the TALK key.

4.09 Momentarily ground the S (or the SN) lead of the line to operate the CO relay using a 760 cord. If there is no leakage, the needle should return to zero. Any deflection indicates an insulation leak on the line. Record the voltmeter deflection if it exceeds 5 volts.

Note: In certain equipments such as the No. 375A Community Dial Office the cut off relay winding is cabled to a terminal designated "SN."

4.10 Remove the test connections.

(C) Connector Banks and Multiple

4.11 At the HIDF (or CDF) connect the No. 59 cord tips associated with the W2AY cord to the tip and ring terminals of the first non-working equipped line in the connector group under test. Connect the white conductor to the tip and the red conductor to the ring. Observe the meter first with the REV key normal and then in the operated position. If in either case the needle of the meter is deflected beyond the end of the scale, it is an indication that the line or the intercept trunk associated with the group of vacant lines is busy, in which case disconnect and proceed to another connector group.

Note: If the line is connected to an intercept trunk the test can be applied in the above manner only in the cases where the trunk has no bridged apparatus on the tip and ring. If the trunk has bridged apparatus, it will be necessary to temporarily disconnect the tip and ring jumpers of the intercept trunk.

4.12 If the line is idle, any deflection of the meter is an indication of leakage on the connector bank terminals associated with the line or lines under test. Record the voltmeter deflection if it exceeds 5 volts.

4.13 Remove the test connections and repeat the test on the next non-working line or a non-working line associated with the next intercept trunk in the same or succeeding connector group.

Note: Where several non-working lines are connected to the same intercept trunk, it is necessary to test only one line in each intercept group.

5. REPORTS

5.01 The required record of these tests should be entered on the proper form.