

## CLICK REDUCING VARISTORS IN OPERATOR TELEPHONE CIRCUITS RESISTANCE TEST

### 1. GENERAL

1.01 This section describes methods of checking the maximum resistance limits of click reducing varistors (including 93A or 94A resistances) wired in operator's telephone circuits, to determine whether clicks will be reduced to a satisfactory level.

1.02 This section is reissued principally to correct the test apparatus information and to make minor revisions in the text.

1.03 The tests covered are:

(A) 28 Ohm Test

(B) 15 Ohm Test

1.04 The tests covered in this section are based on rejecting the varistors when the d-c resistance at a given voltage is exceeded. Test (A), in which the resistance should not exceed 28 ohms at 3 volts, is intended for use under conditions where the immediate outside plant facilities are not exposed to low frequency induction. Test (B), in which the resistance should not exceed 15 ohms at 3 volts, is intended for use where the immediate outside plant facilities are exposed to low frequency induction.

1.05 The procedures covered herein are based on the assumption that under test conditions, either there is no d-c path in parallel with the varistor or an induction coil winding is connected in parallel with the varistor. Therefore all parallel d-c paths other than the induction coil winding should be disconnected before proceeding with the test. Leads should be unsoldered at the shunting apparatus and not at the varistor. Any leads disconnected for test purposes should be reconnected at the completion of the test.

### 2. APPARATUS

#### Tests (A) and (B)

2.01 35 type Test Set.

2.02 P2AE Cord, 4 feet long, equipped with one No. 310 Plug and one No. 289A Plug (2P16A Cord).

2.03 W2W Cord, 6 feet long, equipped with one No. 310 Plug and two No. 360 Tools (2W17A Cord), with No. 365 Tools inserted in the No. 360 Tools.

2.04 W2CF Cord, 1 foot long, equipped with one No. 310 Plug and two No. 360 Tools (2W17D Cord), with No. 365 Tools inserted in the No. 360 Tools.

2.05 Four KS-6542 Dry Cells connected in series.

#### Test (A)

2.06 18BE Resistance (20 ohms  $\pm$  1%) and 18GU Resistance (8 ohms  $\pm$  1%) wired in series, or equivalent.

2.07 19KC Resistance (47 ohms  $\pm$  1%), or equivalent.

#### Test (B)

2.08 19EK Resistance (15 ohms  $\pm$  1%), or equivalent.

2.09 19FE Resistance (22 ohms  $\pm$  1%), or equivalent.

### 3. METHOD

3.01 See that all keys and switches of the 35 type test set are normal and that all slides are at the extreme right.

3.02 Insert the plug of the W2W cord into the BAT and GRD jack of the 35 type test set and connect the white (tip) conductor of the cord to the positive terminal of the battery and the black (ring) conductor to the negative terminal.

#### (A) 28 Ohm Test

3.03 Connect the No. 365 tools of the W2CF cord to the 28 ohm resistance. Insert the plug of the cord into the T and R jack of the test set.

3.04 Operate telegraph key 1 of the test set and adjust the associated sliders until the milliammeter reads .110 ampere. Release the telegraph key.

Note: The telegraph key should be operated only long enough to observe the milliammeter reading, thereby avoiding unnecessary drain on the battery.

3.05 Check the condition of the battery by connecting a 47 ohm resistance in place of the 28 ohm resistance and operate telegraph key 1. The milliammeter should not indicate

## SECTION 032-170-501

less than .072 ampere. If the reading is less than .072 ampere the battery should be replaced, and 3.04 and 3.05 should then be repeated. Release the telegraph key. This check is not required on each test but should be made often enough to assure that the battery is in satisfactory condition.

→ 3.06 Remove the plug from the T and R jack and connect the T and R jack to the C and D jacks of the telephone circuit to be tested, using the P2AE cord.

3.07 Operate telegraph key 1 of the test set and read the milliammeter. Operate the REV key of the test set and again read the milliammeter. Release the telegraph key. If the reading in either case is less than .110 ampere, the varistor is defective and should be replaced.

Note: The telegraph key should be operated only long enough to observe the milliammeter reading, thereby avoiding undue heating of the varistor and unnecessary drain on the battery.

### (B) 15 Ohm Test

→ 3.08 Connect the No. 365 tools of the W2CF cord to the 15 ohm resistance. Insert the plug of the cord into the T and R jack of the test set.

3.09 Operate telegraph key 1 of the test set and adjust the associated sliders until the milliammeter reads .200 ampere. Release the telegraph key.

Note: The telegraph key should be operated only long enough to observe the milliammeter reading thereby avoiding unnecessary drain on the battery.

3.10 Check the condition of the battery by connecting a 22 ohm resistance in place of the 15 ohm resistance and operate telegraph key 1. The milliammeter should not indicate less than .150 ampere. If the reading is less than .150 ampere the battery should be replaced, and 3.09 and 3.10 should then be repeated. Release the telegraph key. This check is not required on each test but should be made often enough to assure that the battery is in satisfactory condition.

→ 3.11 Remove the plug from the T and R jack and connect the T and R jack to the C and D jacks of the telephone circuit being tested, using the P2AE cord.

3.12 Operate telegraph key 1 of the test set and read the milliammeter. Operate the REV key of the test set and again read the milliammeter. Release the telegraph key. If the reading in either case is less than .200 ampere, the varistor is defective and should be replaced.

Note: The telegraph key should be operated only long enough to observe the milliammeter reading, thereby avoiding undue heating of the varistor and unnecessary drain on the battery.

### 4. REPORTS

4.01 The required record of this test should be indicated on the proper form.