BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G50.225.1
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AT&T Co Standard

CABLE TESTING—GENERAL
BREAKDOWN TEST SET BO-240457

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1. GENERAL

1.01 This section describes the use of the breakdown test set in locating high resistance faults resulting from moisture in exchange type cables.

1.02 The primary use of the set is to reduce the fault resistance between the defective wires of a pair so as to permit running down the fault with tone and an exploring coil.

1.03 The breakdown test set can also be used to advantage in cases where the entire cable is out of service or where a Wheatstone Bridge location can not be made.

1.04 Where a Wheatstone Bridge location has been made, the breakdown test set will be found helpful when the fault resistance is too high to permit running down the fault with an exploring coil.

1.05 The breakdown test set must always be connected to the tip and ring of the pair under test. **It must not be connected to one side of a pair and ground or between the sides of two different pairs.**

1.06 The description and maintenance of the set are covered in Section G86.060.1.

2. SELECTION OF TEST PAIR

2.01 The breakdown set should be applied as near the fault as practicable.

2.02 The general location of the fault should be determined if possible by Wheatstone Bridge measurements or by analysis of the pair count affected.

2.03 The pair or pairs having the lowest fault resistance should be used for the test.

3. PRECAUTIONS

3.01 Each test pair shall be isolated from the central office equipment either by removing the cross-connection at a cross-connecting terminal or by removing the heat coils at the central office. In the latter case, the carbon blocks should be replaced with insulating blocks and the test pair distinctively marked to warn central office personnel that breakdown tests are in progress. The distinctive marking shall not be removed, nor shall the pair be restored to normal until the test on the pair are completed.

3.02 The workman shall visit all terminal appearances of the pair and:

(1) Disconnect all stations and protectors associated with the pair.

(2) Disconnect all dead wires associated with the pair.

(3) Rearrange any wires which are in contact with the binding posts of the pair.

(4) Determine if the pair terminates in any textile insulated wire forms.

3.03 If the pair terminates in a textile insulated form (including the central office form) and if a bridge measurement or pair analysis has not definitely eliminated the possibility that the fault may be in the form, apply breakdown voltage at that point, or station a workman there to observe for evidence of breakdown.

3.04 The workman making the test shall call the test desk to determine if any other men are working in the cable in the section to which the breakdown voltage will be applied. These men should be advised to suspend work on the cable until the breakdown test is concluded, and if practicable observe the cable at their location for any evidence of breakdown.

3.05 The 630V switch should always be in the OFF position except when the high voltage breakdown is being applied.

3.06 After the above precautions have been observed, the breakdown set may be connected to the test pair.

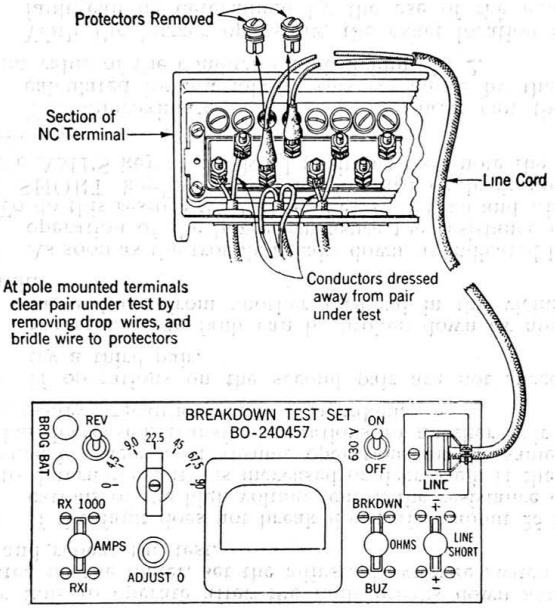
3.07 On completion of the breakdown test the operator shall notify the test deskman who will, in accordance with local routine, notify any workmen who are observing on the cable that the tests have been completed.

4. OPERATING PROCEDURE

4.01 The use of the set is outlined below. For convenience the keys are referred to by the designation in the normal position.

4.02 The set should preferably be operated in a car or truck. If this is impracticable, place the set on a rubber blanket or B Splice Covering on the ground.

4.03 Connect the test clips of the Breakdown Test Set Line Cord to the pair under test and then insert the plug into the line jack on the breakdown set, as illustrated below.



4.04 Set the adjustable voltage switch (0 to 90 volts) at 22-1/2 volts. It will usually be advisable to reduce this voltage as soon as the buzzer operates after the breakdown. There is less likelihood of the tone carrying beyond the fault when the lowest practicable buzzer battery voltage is used.

4.05 With the LINE SHORT key locked in the forward ± position apply voltage to the line by operating the OHMS key to the BRKDWN position. Then release the OHMS key and move the LINE SHORT key to the back ∓ position. Again operate the OHMS key to the BRKDWN position. The OHMS key should be held each time for about 1 second. Longer application of the breakdown potential usually tends to clear the fault and will reduce the effective life of the batteries.

4.06 Continue to operate the two keys in this manner throughout the test. **Do not change the position of the LINE SHORT key while the OHMS key is in BRKDWN position,** as the heavy current flow may damage the key contacts.

4.07 When the fault breaks down, current will pass through the fault and the meter will show a steady reading of 1 ampere or more. When this occurs, immediately throw the 630V switch to the OFF position and pull the OHMS key to the BUZ position immediately to apply tone to the line. Leave the LINE SHORT key in either the forward or back position.

4.08 If the buzzer does not operate, apply the breakdown voltage again to the line to break down the fault. If the buzzer fails to operate after the fault breaks down again as indicated on the meter, set the adjustable voltage switch to 90 volts and repeat the test.

4.09 If the fault does not break down after about 25 applications of the high voltage, check the resistance of the fault to determine if it has increased or decreased. If the fault resistance has decreased, resume operations on the same pair. If it has increased, transfer operations to another pair after the necessary precautions have been taken.

4.10 If operations on the second pair are not successful, try a third pair.

4.11 Sometimes the fault can be broken down by applying the voltage from another terminal in the vicinity of the fault.

4.12 As soon as the trouble breaks down, as indicated by the operation of the buzzer, measure the resistance of the pair. To do this restore the OHMS key to normal and with the LINE SHORT key at either the forward or back position, hold the AMPS key at the R x 1 position; then note the meter reading.

4.13 The approximate distance to the fault can then be calculated by multiplying this resistance by the feet-per-ohm value of the conductor and dividing by 2.

4.14 With the buzzer operating, the exact location of the fault can be determined by the use of the exploring coil and amplifier. First listen to the tone on the cable in both directions from the set. If tone is heard in both directions reduce the buzzer voltage until tone is heard in only one direction.

4.15 After the fault has been located return the keys to their normal positions and disconnect the test set.