

An American National Standard **IEEE Standard Test Code for** **High-Voltage Air Switches** (Supplement: Mechanical Operations Test)

Foreword

(This Foreword is not a part of ANSI/IEEE C37.34d-1984, Mechanical Operations Test, supplement to ANSI/IEEE C37.34-1971 [R 1987], IEEE Standard Test Code for High-Voltage Air Switches.)

The purpose of the mechanical operations test for high-voltage air switches is to demonstrate the ability of a completely assembled switch to operate satisfactorily during its operating life expectancy.

The test code has been patterned after IEC Publication 129, Specifications for Alternating Current Disconnectors (Isolators) and Earthing Switches, paragraph 48.

The following specific comments are to assist in your evaluation of each section of the supplement stated below:

4.3 It is necessary to motor operate at minimum and maximum control voltage (as in IEC Publication 129) because operation at other than rated control voltage may produce significantly different forces and stresses from those produced during normal voltage operation.

4.4 IEC Publication 129 allows lubrication during the test. These proposed revisions do not.

5.3 Final judgment for acceptable completion of the mechanical operations test (if there is any concern about contact pressure loss, voltage drop increase, or resistance increase through mechanical wear) requires satisfactory completion of a temperature rise or short-time current test.

Mechanical Operations Test

1. Definition

Mechanical operations test is the test made to determine the mechanical capability of the switch equipment.

typical installation in the field. Modifications shall be limited to operating pipe lengths.

2. General

The purpose of this test is to ensure the satisfactory operation of the equipment in normal service without excessive maintenance.

3. Test Arrangement

A complete air switch shall be tested with a full complement of *its rated strength* insulators and representative operating mechanism components, such as levers, bell cranks, pin joints, universal joints, bearings, etc., as required for a

4. Test Procedure

The rated number of mechanical operations shall be performed on the air switch. Mechanical loadings of the terminals of the test switch shall be in accordance with the switch ratings for 10% of the rated number of mechanical operations.

4.1 The test shall not require that voltage or current be applied to the main circuits.

4.2 Rated mechanical terminal load for each of the four loading conditions shall be applied to each of the terminals of one pole simultaneously as follows:

(1) In a plane parallel to the plane of the mounting base and in the direction of the

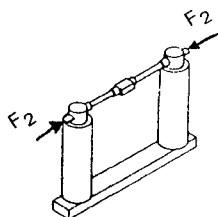


Fig 1a

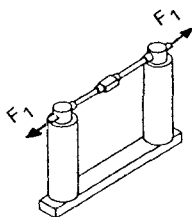


Fig 1b

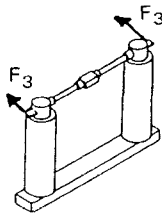


Fig 1c

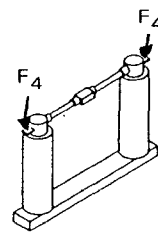


Fig 1d

mounting base toward the switch for one fourth of the operations with terminal loading (Fig 1a);

(2) In a plane parallel to the plane of the mounting base and in the direction of the mounting base away from the switch for one fourth of the operations with terminal loading (Fig 1b);

(3) In a plane parallel to the plane of the mounting base and 90° to the direction of the mounting base for one fourth of the operations with terminal loading (Fig 1c);

(4) In a plane perpendicular to the plane of the mounting base and toward the mounting base for one fourth of the operations with terminal loading (Fig 1d).

4.3 Motor-operated switches shall be tested for 90% of rated operations at rated control voltage, 5% at minimum control voltage, and 5% at maximum control voltage. Control voltages shall be measured at the closest available terminals to the motor.

4.4 During the test, no component shall be repaired or replaced and no maintenance shall be performed.

5. Criteria for Acceptance

5.1 The mechanical operations test shall be satisfactorily completed, if all parts, including contact surfaces, are in good condition and do not show undue wear.

5.2 The contact forces or electrical resistances shall be determined before beginning and after completing the test to verify that no significant change has occurred in the condition of the contacts.

5.3 If there is no doubt about the successful performance of the switch evaluated in 5.2, then a temperature rise test or a short-time current withstand test shall be made to prove acceptable performance. (See ANSI/IEEE C37.34-1971 [R 1987], IEEE Standard Test Code for High-Voltage Air Switches, Section 4 or 5.)

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