SECTION 081-603-101
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AT-6723 AIRFLOW INDICATOR

DESCRIPTION AND USE

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1. GENERAL

1.01 This section describes the AT-6723 airflow indicator and outlines its use in determining the direction of airflow in locating leaks in cable sheaths.

1.02 This section includes information formerly contained in Section 637-410-100.

1.03 The AT-6723 airflow indicator is a direct replacement for the AT-6620 airflow indicator. Replacement parts for the AT-6620 indicator are not available.

1.04 The AT-6723 indicator is used to verify the location of a small leak after an approximate leak location has been determined by means of pressure gradients (see Section 637-410-504). This indicator is especially useful in verifying the location of section leaks in underground cable where the conditions of the sheath may require replacement of the section.

1.05 This airflow indicator also may be used in locating leaks, in aerial cable under favorable conditions, ie, when air temperatures along the cable are reasonably constant, such as the interval between dawn and sunrise. Tests made at other times may be inaccurate as a result of airflow due to temperature difference along the cable.

1.06 When using this indicator, the general plan is to make tests at various accessible points in the suspected area until the cable section is found into which air is flowing at both ends.

1.07 The AT-6723 airflow indicator is a precision tool. Careful handling and interpretation of the results are required.

2. DESCRIPTION

2.01 The AT-6723 airflow indicator (Fig. 1) consists essentially of a clear pyrex glass valve containing a cartridge chamber capped with a rubber stopper and two sight tubes.

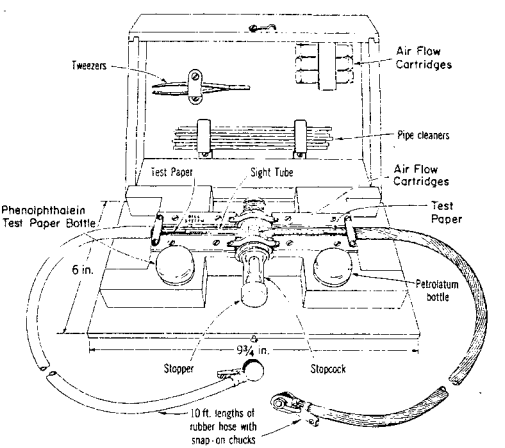

Fig. 1—Airflow Indicator

**Reprinted to comply with modified final judgment.

2.02 The unit is mounted in a wooden case having a removable cover, and is equipped with commercial pipe cleaners, tweezers, airflow cartridges, and two 1-ounce sealed glass bottles. The airflow cartridges contain an ammonia solution. One of the glass bottles contains petrolatum and the other is used for storing phenolphthalein test papers. Two 10-foot lengths of rubber hose of contrasting colors equipped with snap-on chucks are provided for connecting the indicator to test valves on the cable.

2.03 The operation of the indicator is based on the chemical reaction of ammonia vapor on phenolphthalein test paper. When the two hoses are connected to the cable at points 4 or more feet apart, some of the air from the cable will flow through the indicator in the same direction as the air flowing in the cable. The ammonia vapor in the cartridge chamber flows toward one or the other phenolphthalein test papers in the sight tube by the bypassed air from the cable. The action of the ammonia vapor on the normally white test paper causes it to turn pink.

2.04 The glass valve and sight tubes should be cleaned, using a fresh pipe cleaner before and after each test to remove all traces of ammonia that might otherwise react with the test paper and give a false indication. It is recommended that the valve be washed with warm water at frequent intervals.

2.05 To ensure an airtight seal between the ground glass surfaces, petrolatum should be applied in a thin, even coat when the indicator is being prepared for each test.

2.06 Each rubber hose should fit tightly over the sight tube to ensure a satisfactory seal. Some stretching of the hose may be required in placing it over the sight tube.

3. SETTING UP AND READING INSTRUMENT

3.01 The method of making connection to the cable is outlined in Part 4.

3.02 The indicator should be set up at a location where it will not interfere with traffic and where the hose will reach the cable as follows:

(1) Remove the indicator cover and clean the sight tubes, using a fresh pipe cleaner.

(2) Remove the brass pin securing the glass valve to the base. The rubber stopper should be removed and the valve cleaned with a fresh pipe cleaner or warm water.

(3) Lubricate the ground surface of the stopcock with a thin, even coat of petrolatum, then reassemble the indicator.

(4) The stopcock should be turned to the "OFF" position, ie, with the hole through the valve body perpendicular to the sight tubes.

(5) Fold two test papers lengthwise and insert one in each sight tube with the tweezers (Fig. 2).

Note: When light conditions are unfavorable, breathing on the test papers before they are inserted in the sight tubes will produce a more intense color reaction.

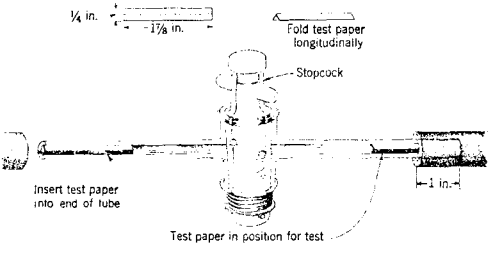

Fig. 2—Positioning Test Papers and Rubber Hoses

(6) The ends of the sight tubes should be moistened and the rubber hoses placed over the glass tubes approximately 1 inch (Fig. 2).

(7) An airflow cartridge should be crushed and placed in the chamber of the stopcock (Fig. 3). The rubber stopper then should be replaced.

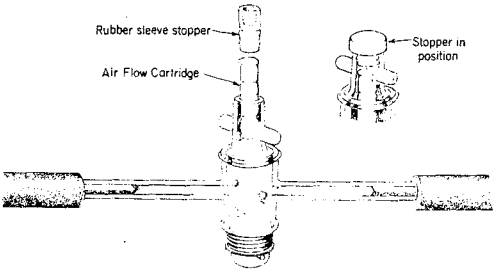

Fig. 3—Placing Airflow Cartridge

(8) Place the snap-on chucks onto the pressure testing valves and carefully observe the test papers for discoloration.

Note: If discoloration occurs in either test paper, the valve is leaking. In this event, remove the snap-on chucks, and repeat Steps (1) through (8). If no discoloration is noted, carefully soap (using E pressure test solution) all potential leak points from one pressure-testing valve to the other and observe for leaks. This is an important check, as minute air leaks in the indicator will give erroneous results.

(9) After the soap tests indicate that the instrument is airtight, wait several minutes to ensure air equalization within the cable, then turn the stopcock to the "ON" position, ie, so that openings in stopcock are in line with sight tubes.

(10) Carefully observe the test papers for discoloration. If there is a flow of air through the instrument, one test paper will turn pink, while the other will remain white. The flow of air will be in the direction of the test paper that has turned pink.

Note: The time required to get a definite indication will vary from 1 to 15 minutes or more, depending on the size and location of the leak. The steeper the slope of the gradient line, the shorter will be the time required for an indication.

(11) When the direction of flow has been established, return the stopcock to the "OFF" position and interchange the snap-on chucks on the two pressure-testing valves.

Note: This is done to check the results of the test just made.

(12) Resoap all joints and inspect for airtightness. If satisfactory, turn the stopcock again to the "ON" position. The test paper which was not discolored now should turn pink, and the test paper which colored previously should show indications of fading.

(13) After the direction of flow has been confirmed, turn the stopcock to the "OFF" position, remove the snap-on chucks from the pressure-testing valves and the hoses from the sight tubes, and remove and discard the test papers.

(14) If further tests are to be made, a careful cleaning by blowing through the sight tubes and swabbing with a pipe cleaner without disturbing the valve or airflow cartridge should be sufficient. One cartridge is satisfactory for several consecutive uses.

Note: If the indicator is not to be used again the same day, the cartridge should be removed and discarded. Clean the instrument, and replace the cover.

4. VALVE ARRANGEMENTS

4.01 When making tests with an airflow indicator, two pressure testing valves are required in the cable. The valves should be spaced 4 or more feet apart. Existing valves should be used when possible, and all new valves should be installed using either the C or F pressure flanges, as described in Section 637-235-201.

4.02 Airflow measurements should not be made until the air pressure in the cable has stabilized, usually 15 to 30 minutes after a new valve is installed. Upon completion of the tests, all temporary valves should be removed, the pressure

testing flange openings capped with pressure flange plugs, and the threads coated with approved pipe thread compound.

Underground

4.03 Typical arrangements of valves for airflow indicator tests in manholes are shown in Fig. 4. The distance between the valve and the duct entrance should not be less than 4 inches when a C pressure flange is installed, or less than 6 inches when an F pressure flange is installed.

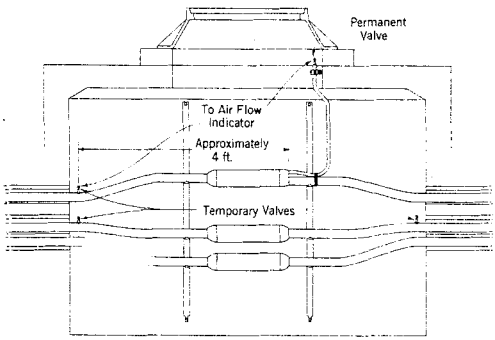

Fig. 4—Typical Arrangement of Valves in Manholes

Aerial

4.04 Typical arrangements of valves for airflow indicator tests in aerial cable are shown in Fig. 5.

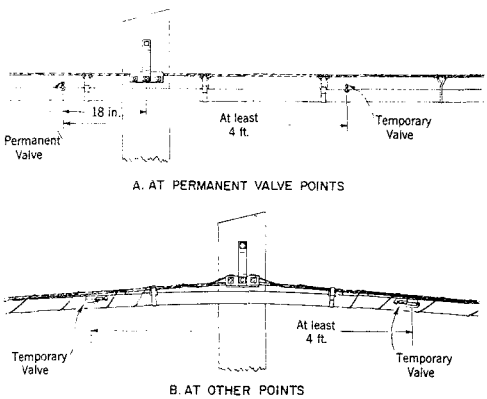

Fig. 5—Typical Arrangement of Valves in Aerial Cable

5. MAINTENANCE

5.01 The airflow indicator should be repaired in the field whenever possible.

5.02 The rubber hoses should be replaced when the overall spread of the hoses (when attached to the indicator) is less than 6 feet, or when the hoses show general deterioration. Tight joints should be maintained with the sight tubes by cutting off short lengths of hose when the hose becomes stretched and slides onto the sight tubes too readily.

5.03 The valve body is fragile and must be handled carefully to avoid breakage. In case of breakage, the replacing unit should be installed as follows:

(1) Loosen the screws holding the four brass mounting strips and slip the hooked end of the strips out of the holding position.

(2) Remove and discard the defective body.

(3) Clean the carrying case, paying particular attention to the white sighting chamber.

(4) Place the new body in position.

(5) Replace and tighten the brass mounting strips.

6. REPLACEMENT PARTS

6.01 The list of replacement parts for the AT-6723 airflow indicator is as follows:

1. ***Extra Handle***—Chain with snap hook and machine screws, also nuts and washers to attach handle to hose.

2. ***Glass Valve Assembly***—Glass valve complete.

3. ***Rubber Stoppers***—For ammonia chamber in valve.

4. ***Phenolphthalein Test Paper***—Fifty test papers furnished in glass bottle.

5. ***Rubber Hose***—Available in both black or white. Specify color and if chucks are required. A 10-foot length of each color hose normally is required.