

B FLOW INDICATOR DESCRIPTION AND USE

1. GENERAL

1.01 This section describes the B Flow Indicator used in leak location work on pressurized cables.

1.02 This section is reissued to revise information for using and reading the indicator and to add a reference to Section 637-411-503 for leak locating computations. Since this reissue covers a general revision, the arrows ordinarily used to indicate changes have been omitted.

1.03 The B Flow Indicator has two principal uses:

(1) For determining the difference in pressure between two closely spaced valves on an underground or buried cable, as in a manhole when a cable leak is indicated in a section between two manholes. See Section 637-411-503 for method of computing leak location.

(2) For determining direction of flow of gas in leak location work. This device can be used where the gas flow is very small (less than 0.1 scfh), whereas the Air Flow Indicator described in Section 081-600-011 is effective only at flows of 0.1 scfh and higher.

1.04 The B Flow Indicator is a precision instrument requiring careful handling.

2. DESCRIPTION

2.01 The B Flow Indicator illustrated in Fig. 1 consists of an alcohol manometer mounted on an aluminum plate hinged to an aluminum base. Each end of the U tube is equipped with a 10-foot length of rubber hose and a snap-on air chuck for connecting the indicator to pressure-testing valves on the cable. The indicator is supplied in a wooden carrying case. The indicator and case weigh about 21 pounds.

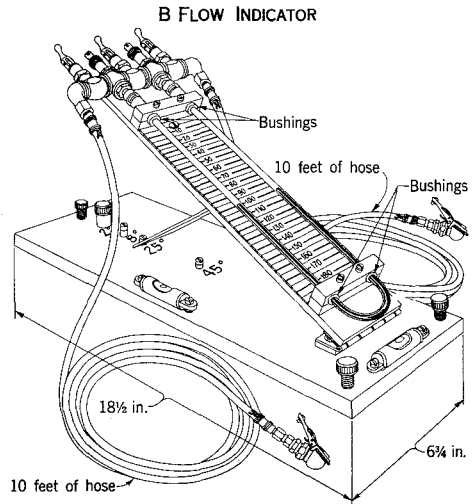


Fig. 1 — B Flow Indicator

2.02 Colored alcohol is used as the pressure indicator. A spare bottle of alcohol is supplied with the instrument. In an emergency, uncolored alcohol can be used. Oil must not be used.

2.03 The scale on the top surface of the plate is for reading the pressure difference. The tube can be set at angles of 45°, 25°, 8°, and 2° to the horizontal. The pressures measured in pounds per square inch per scale division at these angles are approximately .001, .0006, .0002, and .00005, respectively. There are actually 10 division lines between each two marked divisions on the scale; hence at a 45° angle setting of the plate, the pressure difference between a reading of "10" and "20" would be computed as $10 \times .001 = .01$ psi.

2.04 The base of the indicator is equipped with three screws and two spirit levels for leveling the instrument.

3. SETTING UP AND READING INSTRUMENT

3.01 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) Carefully remove the instrument from the case and set it up on the pavement or on top of the case.
- (2) Place the U tube in the 45° position.
- (3) Level the base of the instrument by means of the adjusting screws and spirit levels.
- (4) Make sure the left- and right-hand valves of the indicator are closed. Open the center valve and level the alcohol in the two legs of the tube to the same height on the scale by means of the two front adjusting screws. (See Fig. 2.)

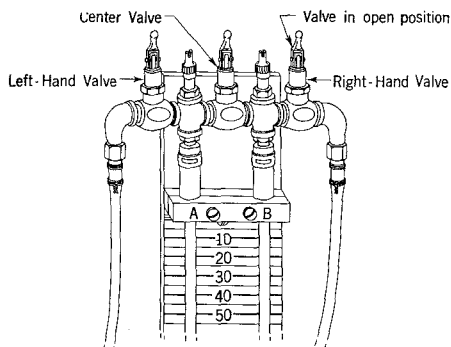


Fig. 2 — Valve Arrangement on B Flow Indicator

- (5) Connect the chucks to the valves on the cable quickly to avoid appreciable loss of gas which may disturb the pressure gradient in the cable. Soap the chucks to assure gas tightness.
- (6) Open the left- and right-hand valves of the indicator.
- (7) Close the center valve of the indicator.
- (8) Note the difference in pressure on the scale. The legs of the manometer are marked "A" and "B" to facilitate reading and recording. The liquid level should come to rest in about 1 minute. If the liquid level does not settle within a minute or two, the connections may be faulty and should be soaped and inspected for tightness.

(9) If the difference in level is small, lower the tube as necessary, to the 25°, 8°, or 2° angle to obtain greater sensitivity. If the tube is lowered, relevel the alcohol in the two legs of the tube by repeating operation (4). Then repeat (6), (7), and (8).

(10) Note and record the level of the alcohol in legs "A" and "B" of the manometer. Then open the center valve and close the left- and right-hand valves.

(11) Interchange the chucks on the cable valves, and soap for gastightness.

(12) Repeat (6), (7), and (8) and record the level of the alcohol in legs "A" and "B".

(13) After a verification of the pressure difference has been made, check the level of the alcohol in the two legs of the tube to assure that the indicator has not been disturbed during the test. Close the left- and right-hand valves and then open the center valve. The alcohol in the two legs of the tube should return to the same height on the scale as noted at the start of the test.

(14) After the test has been completed, close the three valves on the instrument, remove the chucks from the cable, and replace the instrument in the case.

4. MAINTENANCE

4.01 When required, alcohol can be added to the instrument as follows. (See Fig. 3.)

- (1) Open the center valve.
- (2) Remove the cap and valve core at one end of the U tube.
- (3) Run a copper wire (preferably tinned copper wire) into the glass tube several inches.
- (4) Add alcohol by means of the medicine dropper as shown below, moving the copper wire up and down to break any bubbles that form in the tube.
- (5) Remove the wire, close the center valve and then tilt the instrument so that the liquid will flow first into one leg of the U tube and then the other. This should be done to obtain a thorough mixture of the liquids.
- (6) Replace core and valve cap.

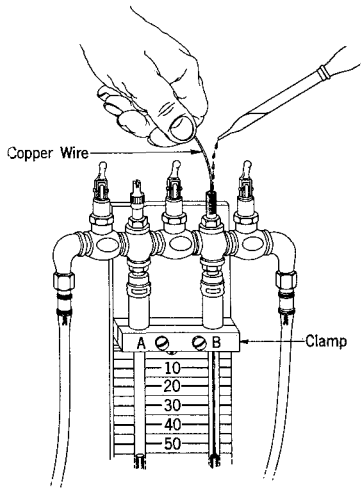


Fig. 3 — Replacing Alcohol

4.02 If carefully handled, the indicator should require very little maintenance. The tube is fragile and must be handled carefully to avoid breakage. In case of breakage, the U tube can be replaced as follows:

- (1) Remove the clamps from the U tube and then the rubber bushings under the lower clamp.
- (2) Lubricate the bushings and rubber hose connection between the tube and valves with water.
- (3) Slide the bushings over the tube into proper position.
- (4) Carefully press the ends of the tube into the rubber hose connections.
- (5) Replace the clamp.
- (6) Refill the tube as indicated in 4.01.

5. REPLACEMENT PARTS

5.01 Ordering information for replacement parts is as follows:

TUBE, GLASS, U, for B FLOW INDICATOR

ALCOHOL, for B FLOW INDICATOR
(available in 2-ounce bottle)