

B, C, AND D

PRESSURE TESTING REGULATORS

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1. GENERAL

1.01 This section covers the description and use of B, C, and D Pressure Testing Regulators. These devices are used to control the flow of compressed gas from nitrogen, helium, and sulfur hexafluoride (SF-6) gas cylinders.

1.02 This section is reissued to:

- Include the D Pressure Testing Regulator
- Omit references to superseded regulators and manometers
- Omit references to Freon-12 Gas
- Omit field modification instructions for making B and C Pressure Testing Regulators tamper resistant.

2. USE

2.01 B, C, and D Pressure Testing Regulators are for use with gas cylinders when charging cables with:

- (a) Dry Nitrogen Gas (637-300-100)
- (b) Helium Gas (637-416-501)

(c) Sulfur Hexafluoride Gas (637-300-101)

2.02 These regulators are for use in cable pressurization operations only. The C Gas Regulator used in conjunction with pneumatically operated tools is covered in Section 081-601-102.

3. DESCRIPTION

3.01 The B, C, and D Pressure Testing Regulators, are two-stage, pressure-reducing devices to control the outlet pressure from gas cylinders. The regulator outlet pressure can be adjusted to any desired pressure from 0 to 50 psi. The B and C regulators are adjusted with adjustment screws which are integral components of the regulators. The D regulator is adjusted by means of a separate key to discourage tampering.

3.02 Each of the regulators is provided with a safety valve to automatically release excessive pressure, should it build up within the regulator.

B Pressure Testing Regulator

3.03 The B Pressure-Testing Regulator is equipped with a single high-pressure gauge for determining pressure and volume of gas in the cylinder, and a pressure-testing valve for measuring the outlet pressure with a B or C Pressure Gauge. The regulator weighs approximately 6 pounds and has maximum over-all dimensions of 7 by 6-1/2 by 6-1/2 inches. It may be supplied in either of the two designs illustrated in Fig. 1 and 2.

C Pressure Testing Regulator

3.04 The C Pressure Testing Regulator is essentially the same as the B Pressure-Testing Regulator. However, instead of having a pressure-testing valve, it is equipped with a low-pressure gauge for indicating outlet pressure, as well as a high-pressure gauge. The regulator weighs approximately 6 pounds and has maximum over-all dimensions of 7 by 6-1/2 by 6-1/2 inches. It may be supplied in either of two basic designs, one of which is shown in Fig. 3.

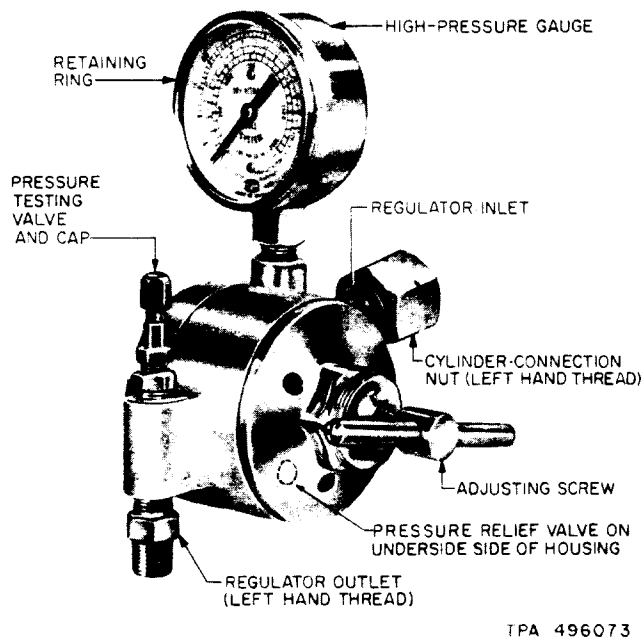


Fig. 1—B Pressure Testing Regulator

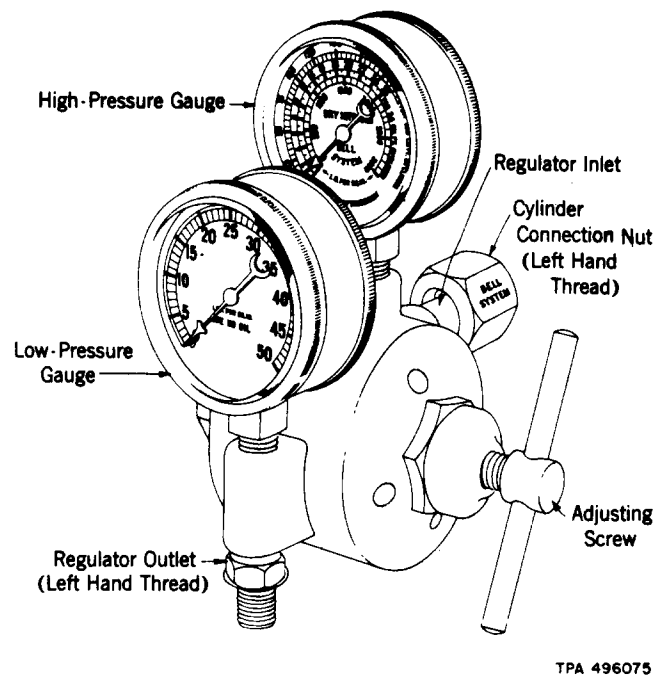


Fig. 3—C Pressure Testing Regulator

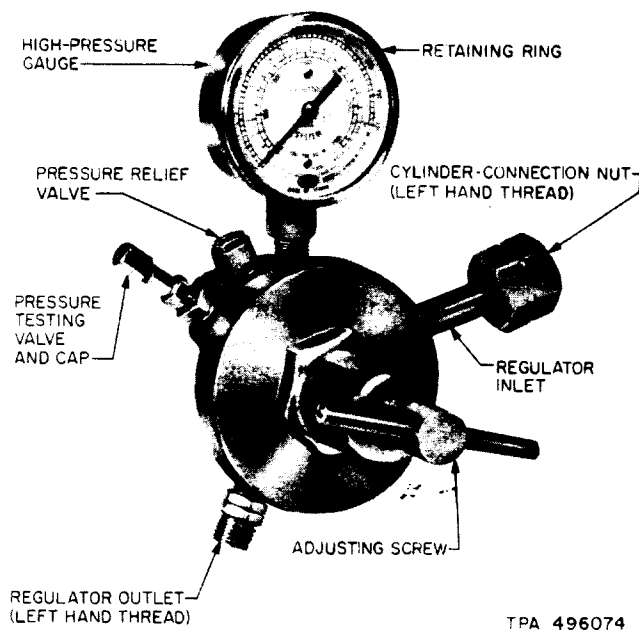


Fig. 2—B Pressure Testing Regulator—Alternate Design

◆D Pressure Testing Regulator◆

3.05 ◆The D Pressure Testing Regulator is designed for use where the regulator might be subject

to tampering or vandalism. It has the following features:

- A pin-type pressure indicator (instead of high-pressure gauge) to show amount of gas remaining in the gas cylinder (3.06).
- A pressure testing valve for determining the delivery pressure with a B or C Pressure Gauge (instead of low-pressure gauge).
- A removable key for adjusting the delivery pressure (0—50 psi).
- A black finish to make it less conspicuous.◆

3.06 ◆The D Pressure Testing Regulator weighs approximately 6 pounds and has overall dimensions of approximately 7 by 6-1/2 by 6-1/2 inches. It may be supplied in either of the two designs illustrated in Fig. 4 and 5.◆

3.07 ◆The indicator pin is graduated to show when the cylinder is 1/4, 1/2, 3/4, and full. When the top of the indicator pin is flush with the surface of the regulator housing, the cylinder pressure is approximately 125 psi, and about 10 to 15 cubic feet of gas remain in the cylinder.◆

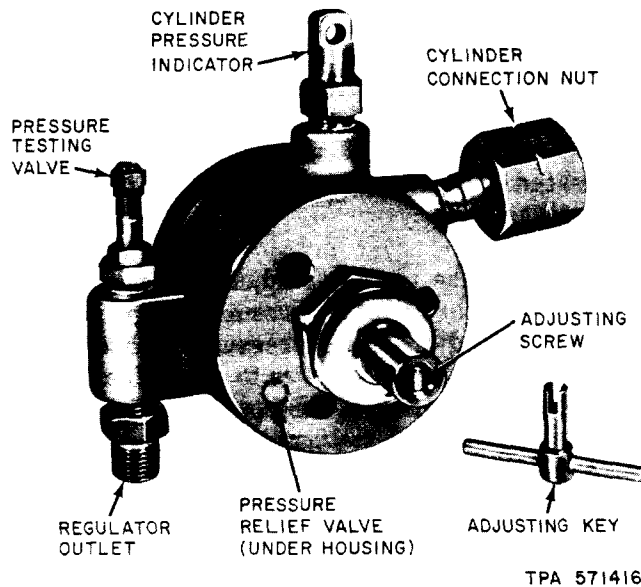


Fig. 4—D Pressure Testing Regulator

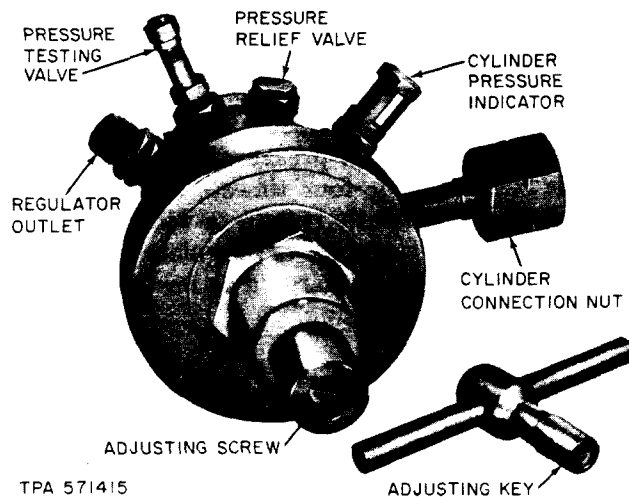


Fig. 5—D Pressure Testing Regulator—Alternate Design

High-Pressure Gauge (B and C Regulators Only)

3.08 The high-pressure gauge has three scales:

- (a) The outer scale indicates the volume of gas in standard cubic feet (scf) in large (224 cubic foot size) gas cylinders. In the case of 112 cubic foot cylinders, the volume is one-half that indicated on the outer scale of the gauge.

(b) The middle scale indicates the volume of gas in standard cubic feet in the B Nitrogen Cylinder.

(c) The inner scale indicates the gas cylinder or regulator inlet pressure in pounds per square inch (psi).

4. INSTALLATION

4.01 Before attaching a regulator to a gas cylinder, open the outlet valve on the cylinder slightly to blow out any moisture or foreign matter which may have collected in the gas outlet. Then close the valve. Turn the regulator adjusting screw (or adjusting key) counterclockwise until it turns freely. Then attach the cylinder connection nut to the regulator connection on the cylinder (or to the special cylinder adapter in the case of SF₆ or helium gas cylinders). Attach the pressure hose to the regulator outlet and open the cylinder valve slowly and completely.

(1) The high-pressure gauge (or indicator pin) should then register the cylinder pressure. Failure of the high-pressure gauge to register is an indication of a defective regulator. Also the registration of pressure by the B or C Pressure Gauge attached to the pressure-testing valve, or the low-pressure gauge, is an indication of a defective regulator. Such a regulator should be removed and replaced by one in good condition.

4.02 The flow of gas through the regulator, and the outlet pressure, is controlled by the regulator adjusting screw or key. To start the flow, slowly turn the regulator adjusting screw or key clockwise until the B or C Pressure Gauge or the low-pressure gauge shows the desired pressure. To shut off the flow, turn the regulator adjusting screw or key counterclockwise until it turns freely. Attach the pressure hose to the pressure-testing valve on the cable.

4.03 Before removing a regulator from a gas cylinder, make certain that the cylinder outlet valve is closed and that the regulator adjusting screw or key is backed out (turned counterclockwise) until it turns freely. ***The regulator might be damaged if the screw is not backed out when the regulator is not in use.***

4.04 All nuts and unions on the regulators should be turned with the B Regulator Wrench described in Section 081-600-103.

5. TESTING FOR PRESSURE CREEPAGE

5.01 With the 2-cylinder method of leak locating or with the normal cylinder charging method, it is important to use a regulator that is free from excessive pressure creepage, and to adjust the regulator pressure *before* connecting the gas cylinder to the cable. Before any regulator is left connected to a cable unattended, it should be tested and adjusted.

Testing B or D Pressure Testing Regulators

5.02 To ensure satisfactory operation with the B Pressure-Testing Regulator or D Pressure Testing Regulator proceed as follows:

- (1) Connect a B or C Pressure Gauge to the pressure-testing valve of the regulator and a pressure hose to the regulator outlet as shown in Fig. 6.

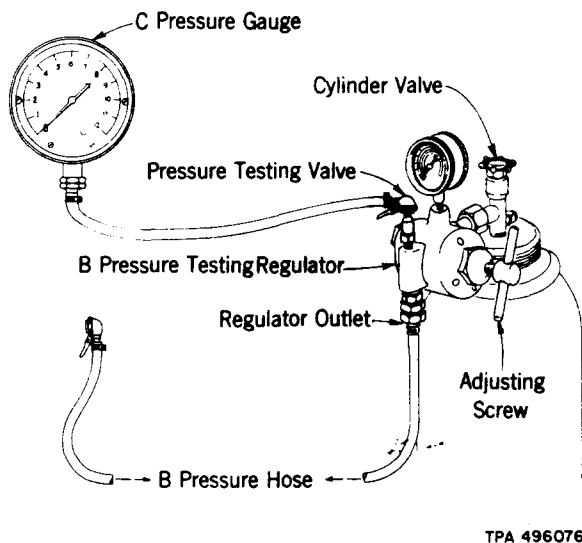


Fig. 6—Testing B Pressure Testing Regulator

♦**Note:** If available, a C Pressure Gauge should be used. The B Pressure Gauge is not as accurate as the C Pressure Gauge.♦

- (2) To make certain that all connections are gastight, adjust the regulator to an outlet

pressure of 9 psi. Then turn the regulator adjusting screw or key counterclockwise and observe the pressure on the B or C Pressure Gauge for about a half minute to determine that the pressure is holding. The regulator can be tested to determine the degree of pressure creepage.

- (3) Turn the regulator adjusting screw or key until the B or C Pressure Gauge indicates the desired charging pressure. Observe the gauge for about 5 minutes to determine whether the pressure rises or "creeps" to a higher value than the original setting. If pressure creepage exceeds 0.5 psi during this period, the regulator should not be used for normal charging or for the 2-cylinder method of leak locating.

- (4) Where excessive creepage occurs, the regulator may be defective and should be further tested as outlined in Part 6.

- (5) If the regulator operates satisfactorily without excessive pressure creepage, note the reading on the B or C Gauge or manometer and then bleed gas for a few seconds by pushing down on the core depressor of the nose chuck. When the core depressor has been released, note any change in pressure reading. Repeat this test three or four times. If the pressure does not consistently restore to within 0.5 pound of the original setting, the regulator should not be used for normal charging or for the 2-cylinder method of leak locating.

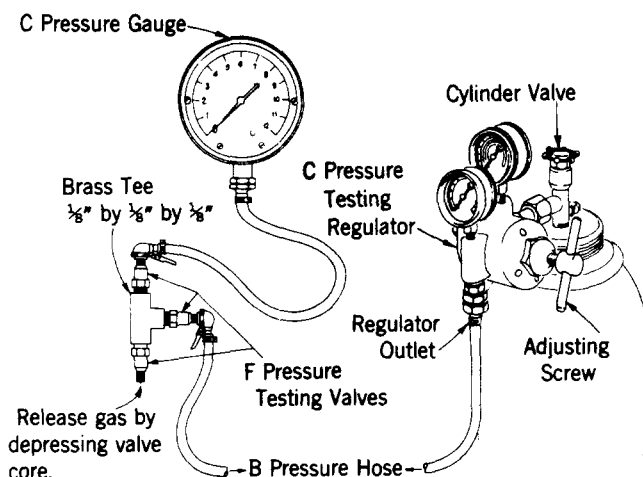
C Pressure Testing Regulator

5.03 To ensure satisfactory operation with the C Pressure-Testing Regulator, proceed as follows:

- (1) Connect a pressure hose to the regulator outlet and then connect B or C Pressure Gauge through a tee to the hose as shown in Fig. 7.

- (2) Make the tests as described in 5.02(2) through (5), releasing the gas as required by depressing the valve core in the tee.

5.04 If the regulator passes these tests, it should be adjusted to the desired charging pressures *before* being connected to the cable. On being connected to the cable the outlet pressure will fall slightly, but as the charging progresses, the flow



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Fig. 7—Testing C Pressure Testing Regulator

of gas through the regulator will diminish and the charging pressure will gradually rise to the original value.

6. MAINTENANCE

6.01 The mechanism of a pressure-testing regulator is such that it should not be disassembled in the field. Defective regulators, other than those requiring replacement of gauge crystals, retaining rings, or adjusting screws, as covered in 6.03, should be returned for repair in accordance with established routine.

6.02 Faulty regulators can generally be recognized as follows.

- (a) Pressure creepage, which results from a leaky low pressure valve.
- (b) Operation of the pressure relief valve on the regulator resulting from a leaky high-pressure valve.
- (c) When either of the preceding conditions occurs, disconnect the pressure hose from the regulator. With the thumb held over the regulator outlet, set the outlet pressure at 10

psi. Then start and stop the flow of gas with the thumb eight or ten times in succession. This will help to dislodge any small particles that may be interfering with operation of the valves and may allow the valve nozzles and seats to readjust themselves.

(d) If the pressure relief valve continues to operate after completing (c), the regulator is defective and should be returned for repair.

(e) Retest the regulator for creepage as covered in 5.02 or 5.03. If the regulator shows excessive creepage it should be returned for repair.

Replacement Parts

6.03 The following replacement parts for the B, C, and D Pressure Testing Regulators are available. Orders for replacement parts should be worded as follows:

(Quantity), Crystal, for (B or C) Pressure Testing Regulator

(Quantity), Ring, Retaining, for (B or C) Pressure-Testing Regulator

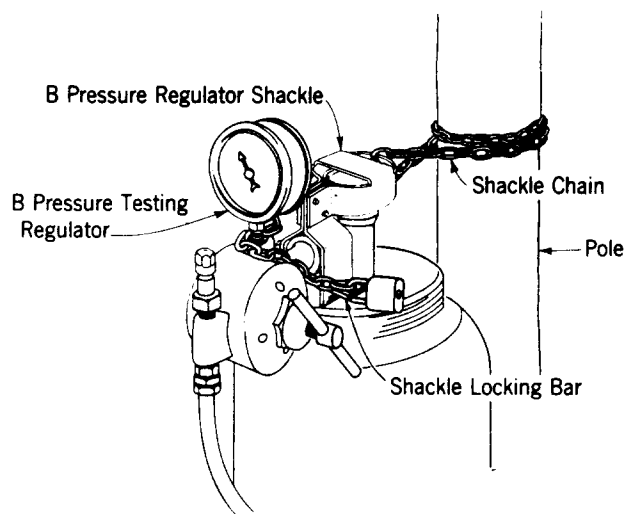
(Quantity), Screw, Adjusting, (Name of Manufacturer) for (B or C) Pressure Testing Regulator

(Quantity), Key, Adjusting, (Name of Manufacturer), for D Pressure Testing Regulator.

(Quantity) Indicator, Pressure, (Name of Manufacturer), for D Pressure Testing Regulator.

7. B PRESSURE REGULATOR SHACKLE

7.01 The gas cylinder and regulator can be secured to the pole with a B Pressure Regulator Shackle is shown in Fig. 8. It will make the equipment less conspicuous and reduce the likelihood of tampering if the locked regulator is covered with a tarpaulin or rubber blanket.



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Fig. 8—B Pressure Regulator Shackle