

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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ACETYLENE TORCHES

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1. GENERAL

1.01 This section replaces Issue 1. It describes the D and E Acetylene Torches used in cable splicing and maintenance, and outlines the precautions that should be followed in using and handling them. The section has been revised to describe the handles that are now supplied as well as to cover the new wrench which is suitable for tightening all connections and for opening and closing the tank valve.

1.02 The D and E torches are similar in design except that the D torch is equipped with 12-1/2 feet of hose and is designed for use with the Prest-O-Lite B (40-cubic foot) tank, while the E torch is equipped with 6 feet of hose and is designed for use with the Prest-O-Lite MC (10-cubic foot) tank. Also, the handle of the D torch is equipped with a control valve.

1.03 The Prest-O-Lite B and MC tanks are not supplied as part of the acetylene torches.

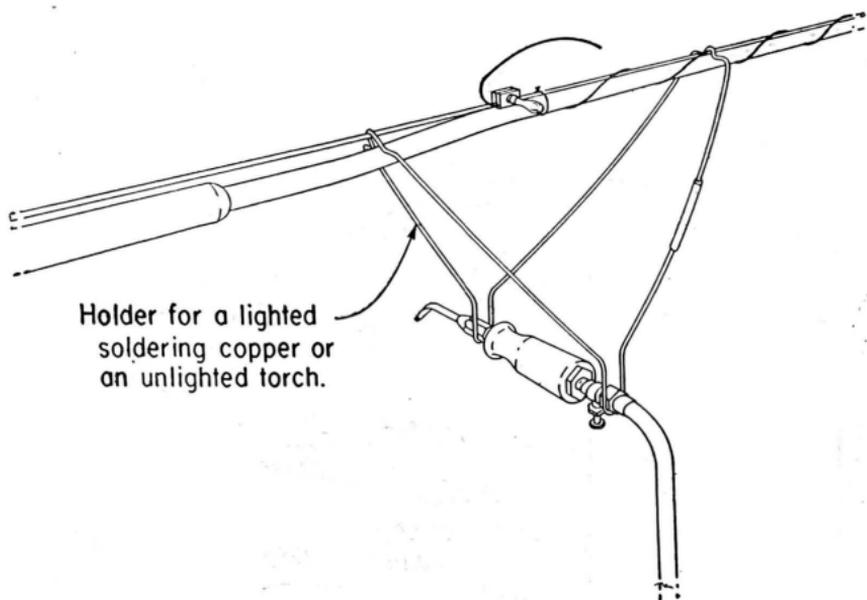
2. PRECAUTIONS

2.01 The following precautions should be observed in using and storing acetylene torches.

(a) The torch shall not be used on underground work, in central office cable vaults nor in splicing pits at main frames.

(b) Aerial tents shall be ventilated while the torch is in operation; the tent flaps should be secured so that they will not blow onto or near the splicing work.

- (c) Always use the lighter to light the torch. Do not use matches.
- (d) Eye protection shall be worn when using the torch for operations near or above eye level.
- (e) The flame of the torch **must not** be directed against the strand as this may cause the strand to break.
- (f) The tank should never be stored in manholes, nor in closets unless they are well ventilated.
- (g) Keep the tank away from fire and heat. Protect the tank in storage against extremes of temperature, from accumulations of ice and snow, from damage which might be caused by passing or falling objects, and from direct rays of the sun.
- (h) If the tank valve should become so difficult to turn, due to water freezing at the valve, that it can not be opened with normal pressure on the wrench, the tank should be brought into a warm room to thaw.
- (i) If, while in use, the tank or torch develops a leak and the gas becomes ignited, turn off the gas at the tank valve. If this is not feasible, place the apparatus in the open and stand 100 or more feet away or behind some protection and warn others of the danger of explosion.
- (j) The gauge on the regulators of B and C torches should be read daily while the torch is being used, to determine whether the regulator is operating satisfactorily. If the gauge reads above 15 pounds, examine the vent hole in the regulator. If cleaning the hole does not reduce the pressure below 15 pounds, the regulator should be considered defective and replaced.
- (k) Always extinguish the torch before it is set aside. A⁷ lighted soldering copper used in soldering conductor joints should be placed in a holder, as shown below, to keep the flame from touching the strand.

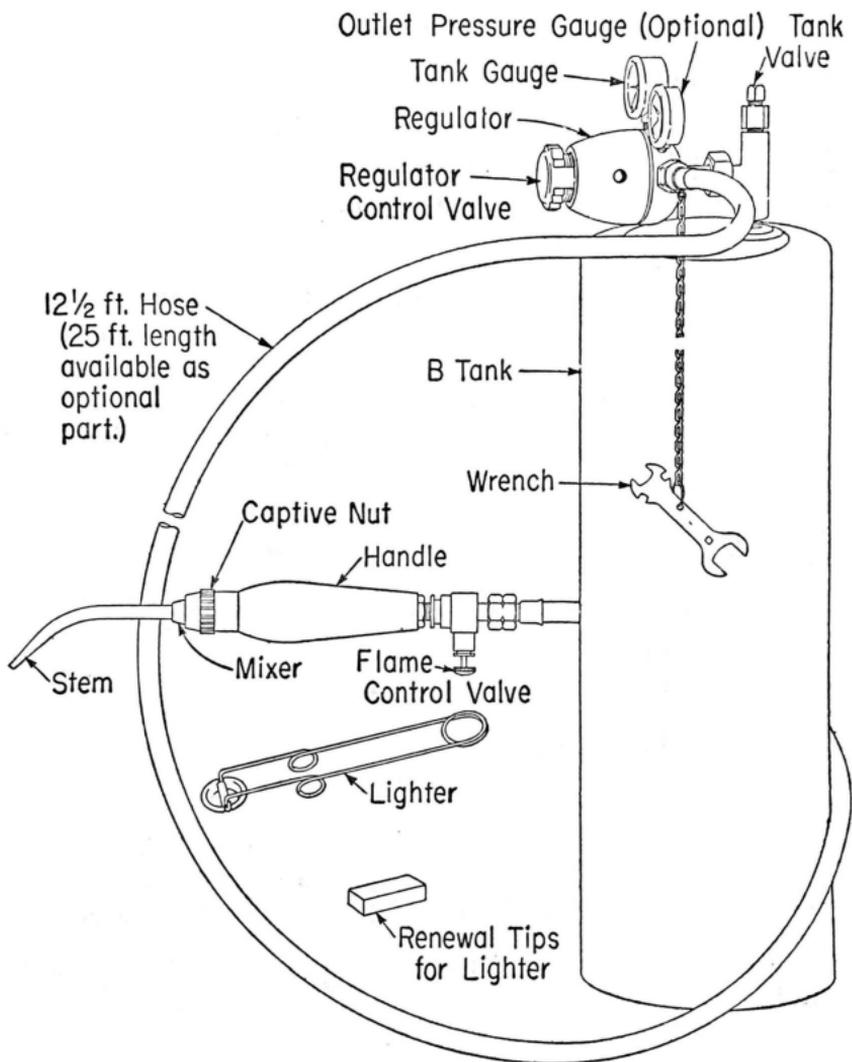


Holder for a lighted
soldering copper or
an unlighted torch.

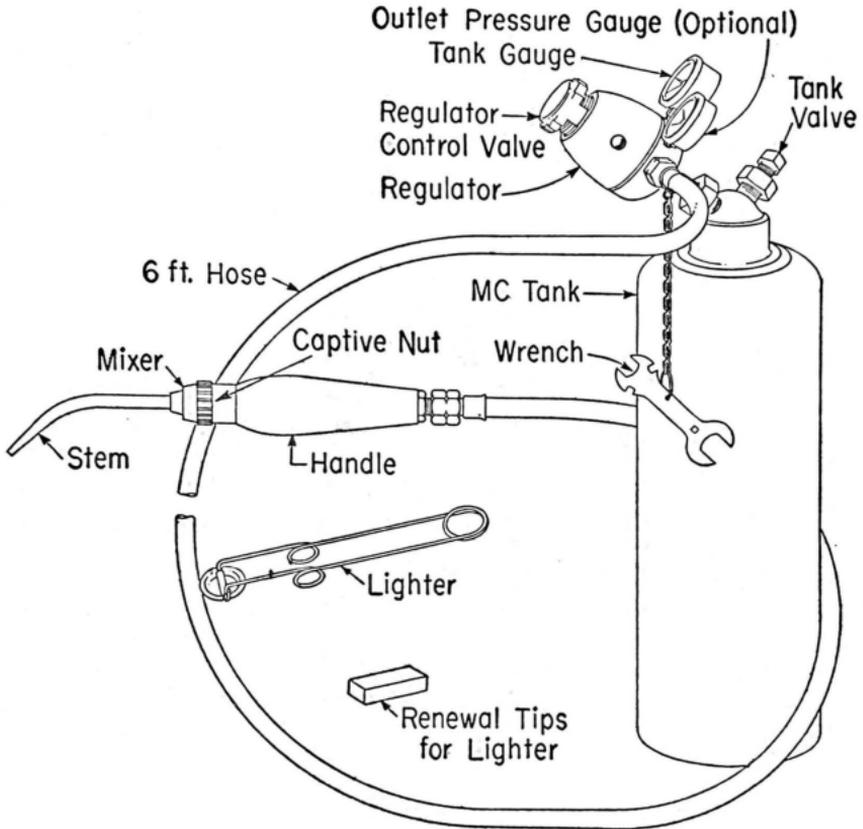
3. DESCRIPTION OF TORCHES



3.01 The D Acetylene Torch, illustrated below, weighs about 3-1/4 pounds and the B tank about 30 pounds.



3.02 **The E Acetylene Torch**, illustrated below, weighs about 2-3/4 pounds and the MC tank about 10 pounds.

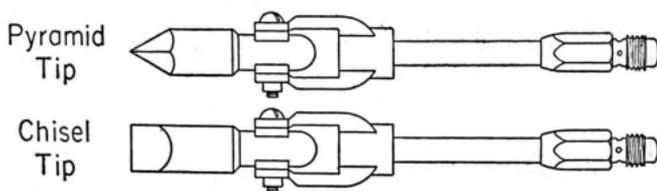


3.03 **Wrench:** The wrench, illustrated in the above sketches, is for use in tightening all connections as well as for use in opening and closing the tank valve. A wrench is not required for connecting the stem and mixer to the handle; the captive nut on the handle is tightened by hand and permits pointing the stem in any direction. The wrench should be kept attached to the regulator, as shown.

3.04 **Gauge:** The tank gauge on the regulator indicates the quantity of fuel in the tank.

3.05 **Soldering Coppers:** The two soldering coppers are shown below; one is equipped with a pyramid tip and the other with a chisel tip. These coppers are intended for use with either the D or E torch. Each copper weighs about 3/4 pound.

SOLDERING COPPER



3.06 The optional parts are indicated below.

Copper, Soldering, (Chisel or Pyramid) Tip, for Acetylene Torch

Coupling, for D Acetylene Torch

Hose, 25 feet for D Acetylene Torch

Gauge, Pressure, Outlet, 15 lb. for Acetylene Torch

3.07 The replacement parts for the torches and copper are listed below.

Regulator, for (D or E) Acetylene Torch

Hose-Assembly, for (D or E) Acetylene Torch

Stem and Mixer, for Acetylene Torch

Handle, for E Acetylene Torch

Handle Assembly, for D Acetylene Torch

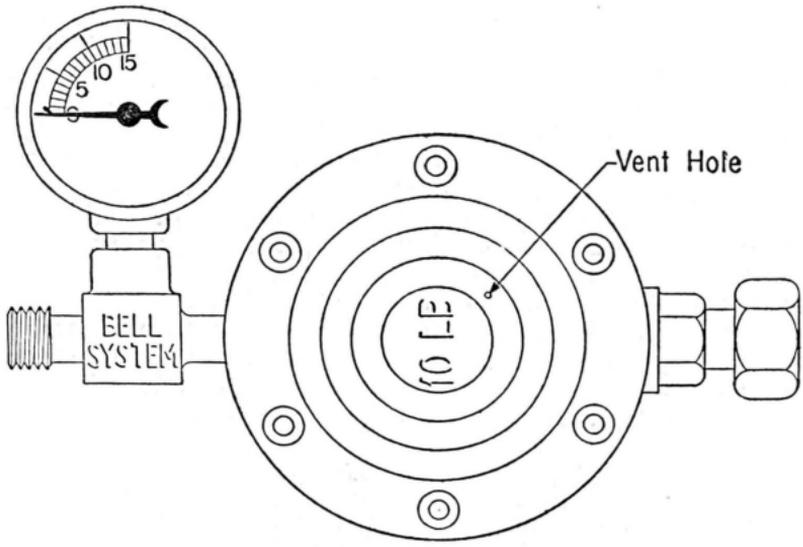
Wrench Assembly, for Acetylene Torch

Lighter, for Acetylene Torch

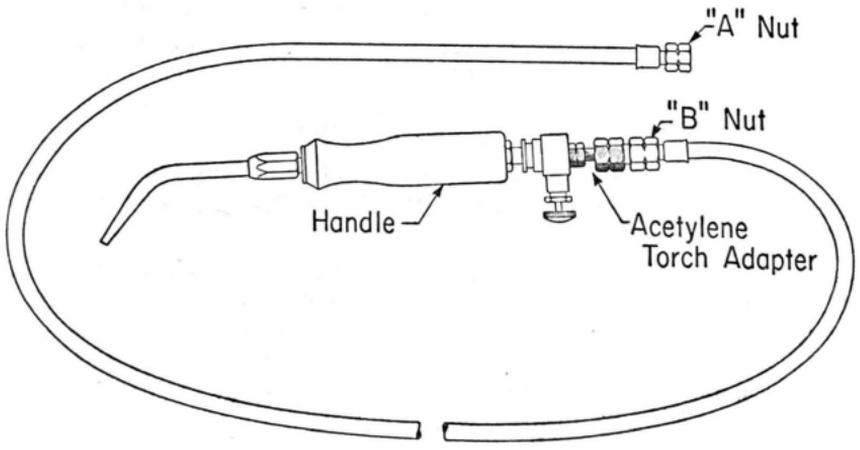
Flints, Lighter, for Acetylene Torch (Box of 6)

Tip, Copper, Soldering (Chisel or Pyramid), for Acetylene Torch

3.08 **Superseded Torches:** The superseded B and C Acetylene Torches are similar to the D and E torches, respectively, except that the superseded torches are equipped with a constant pressure regulator of the type illustrated below and the hoses are fitted with "A" and "B" nuts, while the hoses on the D and E torches are fitted with an "A" nut at each end.



3.09 When the regulator on a B or C Acetylene Torch is replaced by a regulator of the type supplied with the D or E torch, the Acetylene Torch Adapter is required. The adapter is placed between the hose and the handle, as shown below:



4. ACETYLENE TANKS

4.01 The acetylene gas for the torches is supplied in Prest-O-Lite B and MC tanks at a pressure of 250 pounds per square inch at 70° F. The B tank is illustrated in Paragraph 3.01 and the MC tank in Paragraph 3.02. The tanks are tested by the supplier in accordance with Federal regulations for such equipment and are marked to indicate that they have been tested. The markings on the tanks shall not be tampered with nor removed.

4.02 The tanks should always be considered full and handled carefully; they are not built to withstand abuse. They should not be dropped, struck or otherwise damaged.

4.03 Each tank is equipped with a fusible plug which melts at a temperature slightly above that of boiling water, to minimize the possibility of an explosion should the tank become heated.

4.04 Acetylene is a colorless, non-poisonous gas having a distinctive odor which aids in determining whether the gas is escaping. The gas is dissolved in liquid acetone and in this condition is non-explosive. However, free acetylene is highly inflammable and care should be exercised in handling tanks and using torches. Acetylene burns at a high temperature, reaching a maximum of 2800° F. at the end of the blue flame.

5. INSPECTION

5.01 Leaky torches and tanks are dangerous and wasteful of acetylene. Large leaks may be detected by the odor of the escaping gas. The apparatus should be tested for leaks as follows: Connect the torch to the tank, turn off the needle valve, in the handle of the D torch (in the E torch, remove the handle and wrap the end of the hose fitting with CR or DR tape), open the tank valve about 1/2 turn and then open the regulator turning the control valve one turn clockwise. All connections in the apparatus except the connection between the mixer and the handle should be painted with soap solution. The hose should be immersed in water to test for leaks. Damaged hose at a fitting should be repaired, if the remainder of the hose is in good condition. Cut off the defective end and secure the fitting to the hose using a 3/16-inch—3 Hose Clamp. If the hose leaks or appears to be worn elsewhere, it should be replaced. **Never test for leaks with an open flame.** The apparatus should be tested before it is used and weekly while in use. The tanks should be inspected for defects when received and thereafter while they are in use.

5.02 No attempt shall be made to repair a leak in the torch other than to tighten the connections. If there is any evidence of a defect such as a leak, or a dent in the tank in excess of 1/4 inch deep, the tank shall be returned in accordance with local routine to the supplier. If there is a leak, the tank shall be placed outdoors away from fire and other sources of ignition, the valve opened and the tank allowed to discharge. After the tank has been discharged, the valve should be closed and the tank tagged "leaky" or "damaged" and then returned.

5.03 A leak around the valve spindle on the tank can generally be stopped by turning the nut around the spindle to compress the packing.

6. OPERATION

6.01 Before attaching the regulator, open the tank valve slightly for an instant and close again, to blow out dust or dirt which may be lodged in the valve outlet. **Never open the valve near open flames, sources of sparks or other possible source of ignition.**

6.02 The D torch should be assembled and adjusted as follows:

- (1) Connect the regulator to the connection on the tank, tightening the nut clockwise with the wrench.
- (2) Attach the hose to the outlet end of the regulator and to the torch handle, tightening the nuts counterclockwise with the wrench.
- (3) Open the tank valve about 1/4 turn and set the regulator.
- (4) The line pressure is increased by turning the regulator control valve clockwise and decreased by turning it counterclockwise. The control valve has two flat-bottom grooves on which the letters "A", "B", "C", and "D" are marked at intervals of two turns in the thread. At "A" the gas begins to flow, at "B" there is about 5 pounds pressure in the line, at "C" 10 pounds and at "D" 15 pounds. The valve should be set to give the desired operating pressure.
- (5) Open the valve in the torch handle and light the torch using the lighter.
- (6) Turn the valve in the handle to obtain the desired size of flame.

6.03 After completion of the day's work, close the tank valve and then turn the regulator control valve clockwise sufficiently to move the valve point off the seating surface (about 1/4 turn beyond "A").

6.04 The E torch should be assembled and adjusted as follows:

- (1) Connect the regulator to the connection on the tank, tightening the nut clockwise with the wrench.
- (2) Attach the hose to the outlet end of the regulator and to the torch handle, tightening the nuts counterclockwise with the wrench.
- (3) Turn the control valve on the regulator counterclockwise one turn beyond the letter "A". Then open the tank valve about 1/4 turn.
- (4) Turn the control valve clockwise to "A" and light the torch using the lighter.
- (5) Turn the control valve to obtain the desired size of flame.
- (6) Turn the control valve counterclockwise to extinguish the flame.

6.05 After completion of the day's work, close the tank valve.

6.06 The tank gauge shows the approximate quantity of acetylene in the cylinder and reads 1/4, 1/2, 3/4 and FULL.

6.07 The outlet pressure gauge, if provided, shows the working pressure in pounds per square inch.