

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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CABLE SPLICING—GENERAL
CR TAPE PROTECTION

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1. GENERAL

1.01 This section describes the method of preparing and using CR tape to provide temporary protection at uncompleted splices, trouble openings, etc., at locations where the cable is exposed to severe moisture conditions or is likely to become submerged. It also describes the operations necessary to make the CR covering strong enough to withstand the pressures normally used in cables that are maintained under gas pressure.

1.02 This reissue covers the method of installing the 820 Schrader Valve in CR tape.

1.03 **Open splices in working cables must be wrapped** to prevent circulation of air; otherwise, there is danger of the splice catching fire in case an arc occurs between conductors.

1.04 This section illustrates a splice with a straight joint at one end and a Y joint at the other. The methods described can be applied to straight splices and double Y splices.

1.05 Oil, dirt or water reduces the tackiness of the white layer of the CR tape. The tape should, therefore, be kept clean and dry and should be handled as little as possible.

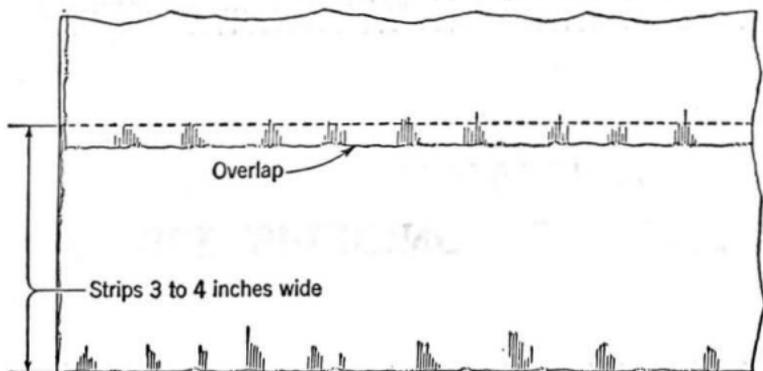
Sunlight tends to shorten the service life of the tape, and it is, therefore, advisable to keep it covered during storage and transportation.

1.06 When CR tape is exposed to freezing temperatures for some time, it tends to lose its tacky or adhesive qualities. The loss of adhesiveness from low temperature is temporary and can be corrected by raising the temperature of the tape before using it. The condition of the tape can be determined by bending a sample piece and removing the separator. If the tape seems to be stiff and the separator does not peel cleanly from the white surface, it indicates that the tape needs warming. In this case, cut the piece required for the job and place it for several minutes in a warm room, a heated tent or motor vehicle cab immediately prior to using. Do not attempt to warm the tape over an open flame. If there is no other warm place available, the piece of tape can be warmed by placing it inside the coat, against the body of the workman.

2. PREPARATION OF CR TAPE

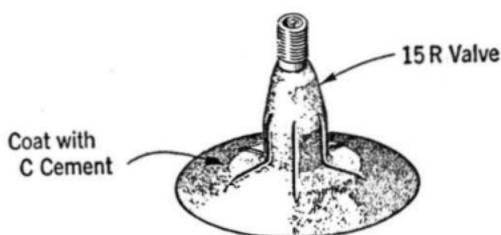
2.01 If the splice is to be covered only once the CR tape should be prepared as outlined below.

- (a) Cut the piece of CR tape to the size required to cover the opening. Remove the separator from the tape by tearing strips approximately 3 to 4 inches wide, parallel to the length of the piece. Replace the strips on the piece, overlapping them as shown in the following illustration and pressing them lightly against the white surface. The purpose of the removal and replacement is to facilitate the final removal of the separator after the tape has been placed over the sheath opening.

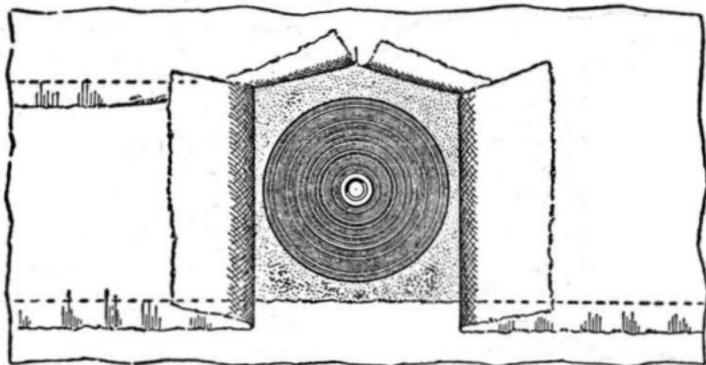


- (b) A 15R or 820 Schrader Valve should be installed in the CR tape, as outlined below.

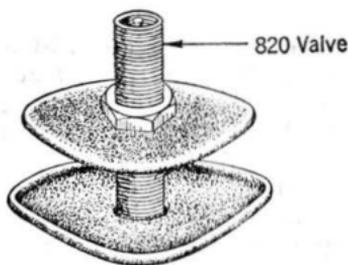
- (1) **15R Schrader Valve:** Clean the stem side of the base of the valve with a carding brush or sandpaper and coat the cleaned surface with C Cement.



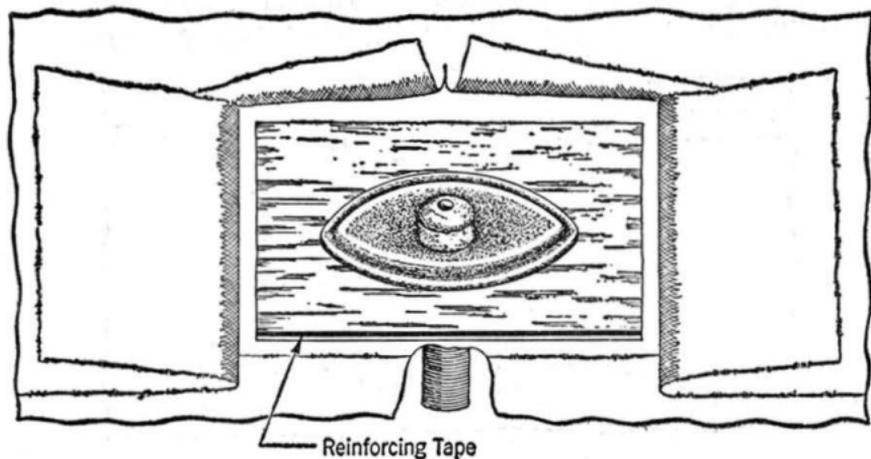
- (2) Determine the location of the valve in the piece of CR tape. Lay the tape on a flat surface with the separator side on top. Cut a 3/4-inch diameter hole in the tape and turn back the separator around the hole. After allowing at least three minutes for the cement to become tacky on the rubber valve, insert it through the hole with the cement coated side toward the white side of the tape. Press the surfaces smoothly and firmly together, taking care not to allow any wrinkles.



- (3) **820 Schrader Valve:** This valve, which is illustrated below, requires no preparation for installation.

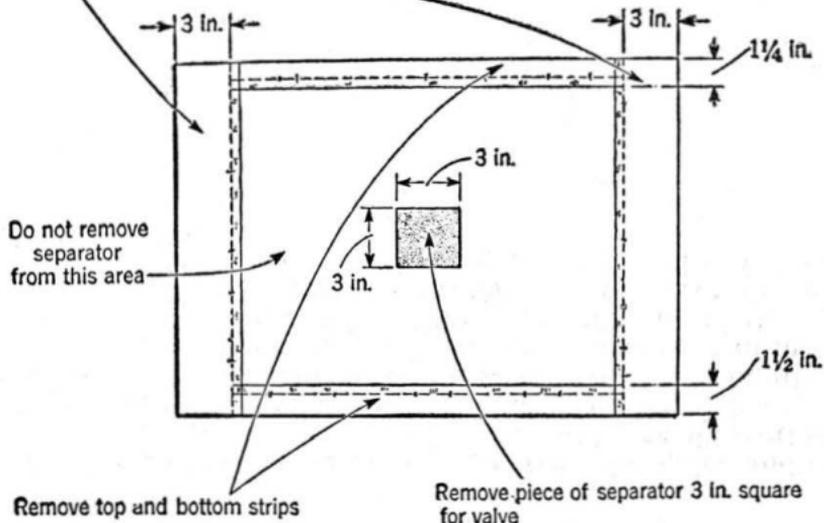


- (4) Determine the location of the valve in the piece of CR tape. Lay the tape on a flat surface with the separator side on top. Cut a 3/8-inch diameter hole in the tape and turn back the separator around the hole. Reinforce the area around the hole with a small piece of CR tape, as shown below. The tacky sides of the tape should be pressed together. Then install the valve and turn up the nut on the valve tightly.



2.02 If an open splice is to be covered a number of times before it is permanently closed with a lead sleeve, it is possible to reuse the CR tape by cutting it somewhat larger than usual. In preparing the tape for this purpose remove only enough separator to ensure a good seal. A prepared piece with the strips of separator removed and replaced is shown below.

Remove end strips

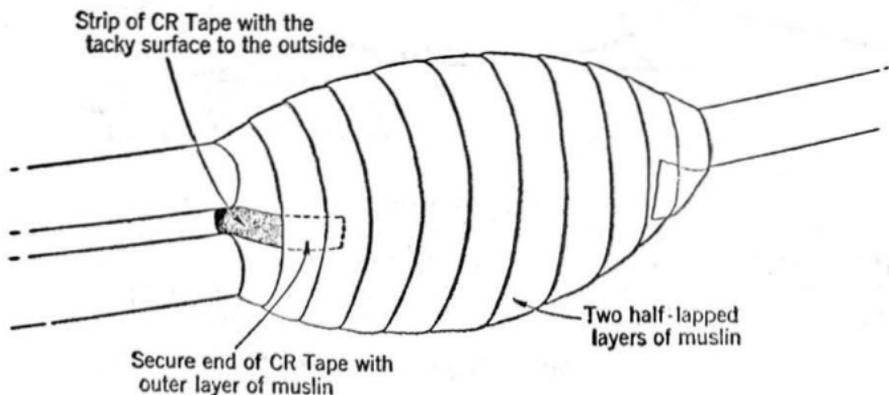


3. PREPARATION OF SPLICE OPENING

3.01 The cable sheath should be smooth and round. If necessary, dress the sheath to remove irregularities. Clean about 4 inches of the sheath at each end and smooth with emery cloth.

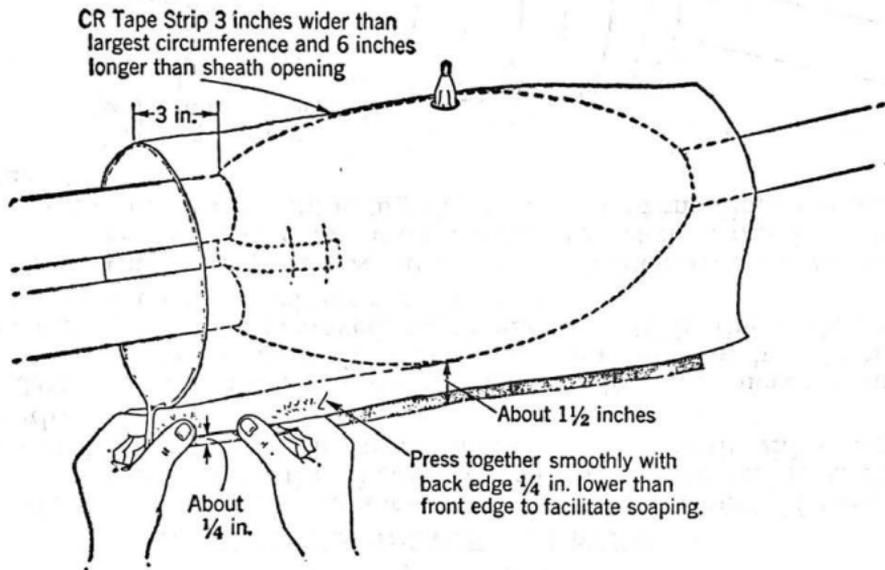
3.02 At a crotch, remove the lead wedge and increase the space between the cables to about 1-1/4 inches. If the wedge can not be removed, place muslin outside the wedge to provide a curved backing for the tape.

3.03 Cut a strip of CR tape about 1/8 inch wider than the crotch space and long enough to reach around to the sides and place after applying the first layer of muslin, as shown below.

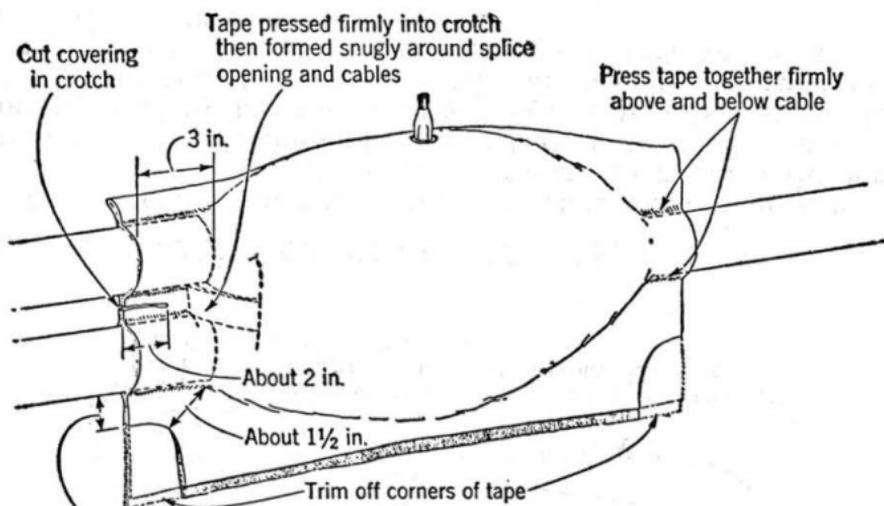


4. APPLICATION OF CR TAPE FOR SINGLE USE

4.01 Cut a piece of CR tape to the dimensions indicated below and prepare it as usual. Install the valve and remove the valve core. Place the CR tape over the splice with the separator against the muslin. Remove the strips of separator and center the tape over the opening.

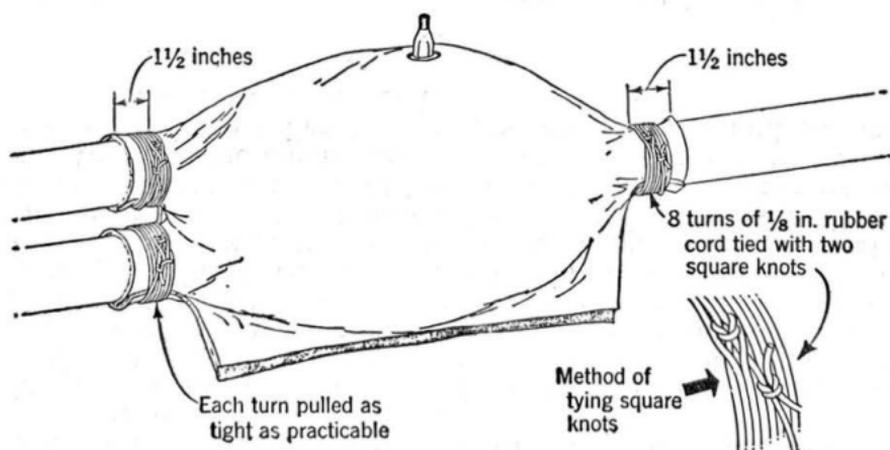


4.02 Form the CR tape to fit snugly over the splice and press the tacky surfaces together smoothly, as illustrated on the following page. Avoid wrinkles and do not stretch the tape excessively. If a wrinkle does occur, stretch the tape slightly and press it together firmly to bond the tacky surfaces and prevent an opening along the wrinkle. Where the contour of the splice permits, the CR tape may be stretched firmly over the upper portion of the top cables, eliminating one end or fin of the tape section to be tied.



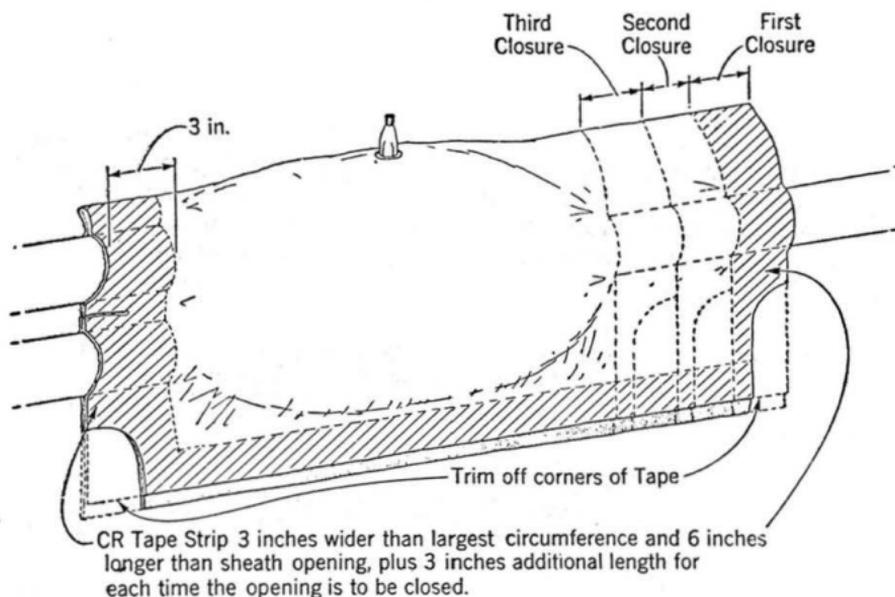
This dimension should be equal to the diameter of the cable if the cable is less than 1 1/2 inches in diameter. On cables 1 1/2 inches in diameter and larger the dimension should be 1 1/2 inches

4.03 Fold the ends of the tape around the cables in the direction in which the rubber cord will be wrapped, apply the cord and tie it, as illustrated below. The length of the unstretched cord should be about five times the circumference of the cable.



5. APPLICATION OF CR TAPE FOR REUSE

5.01 Cut a piece of CR tape to the dimensions indicated below. Prepare the CR tape as outlined in Paragraph 2.02. Cement the valve in place and remove the valve core. Place the CR tape over the splice with the separator against the muslin. Remove the strips of separator. Form the CR tape to fit over the splice and press the tacky surfaces together smoothly as illustrated below. Avoid wrinkles and do not stretch the tape excessively. In some locations, it may not be advisable to place the excess CR tape on the straight side of a splice as this would necessitate a split lead sleeve because of space limitations. Under these conditions, the excess tape should be put on the Y side of the splice opening and all openings and closures should be made from that end.



6. PRESSURE TESTING OF WRAPPING

6.01 Replace the valve core and admit gas at a pressure not exceeding $1/2$ pound per square inch. Soap the longitudinal seam and the end seals. A leak in the seam can usually be repaired by pressing the tape tightly together at the leak. A leak around the cable sheath can usually be repaired by wrapping with an additional rubber cord over and adjacent to the original turns.

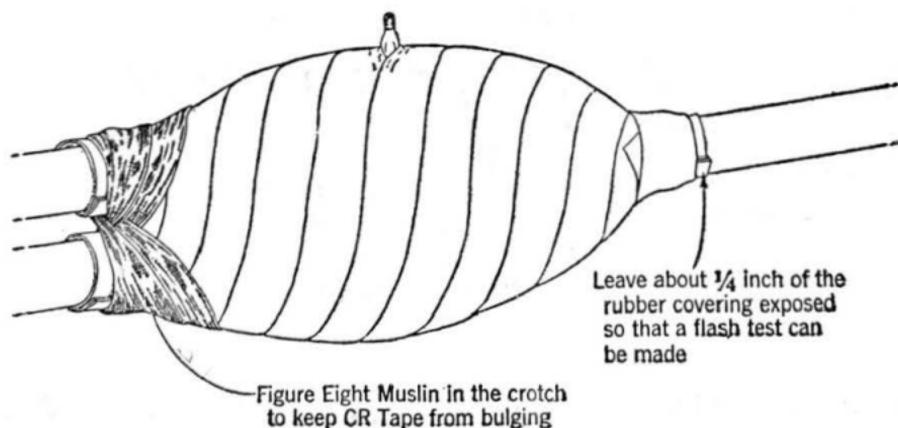
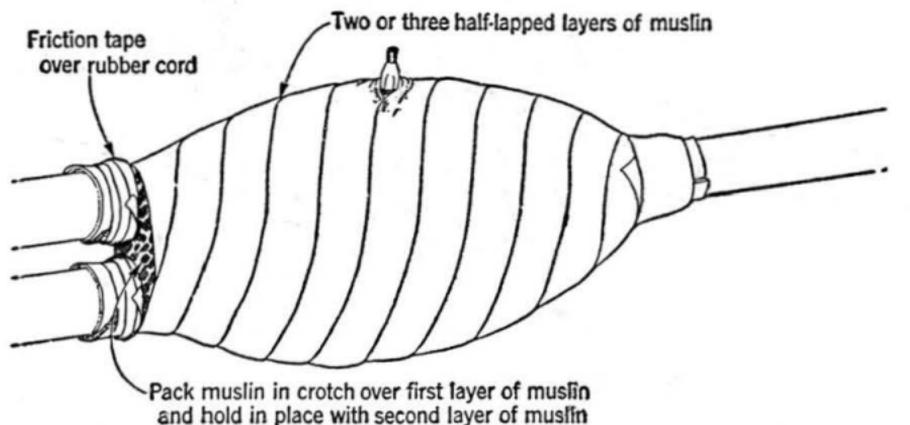
6.02 After the covering is gas-tight, remove the valve core and allow the gas to escape. Then cover the rubber cord ties with two half-lapped layers of friction tape.

6.03 Apply a half-lapped layer of muslin over the CR tape for mechanical protection. Then replace the valve core and cap.

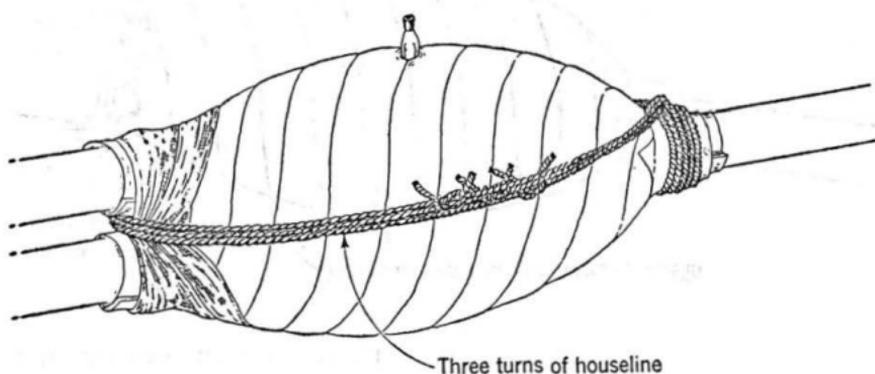
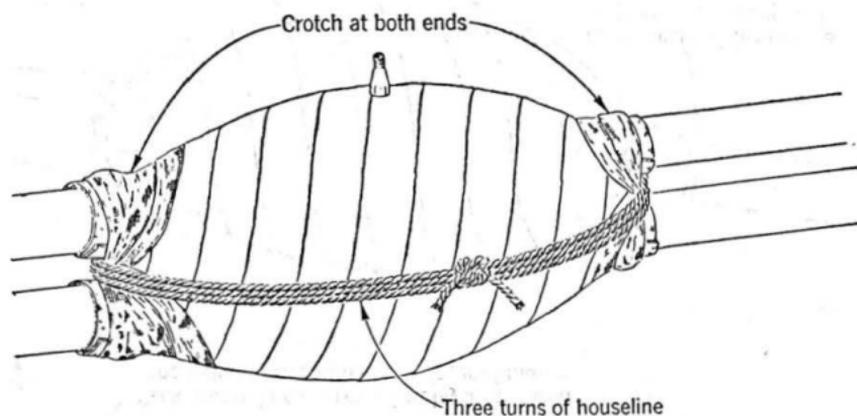
7. CABLES UNDER CONTINUOUS PRESSURE

7.01 In cables maintained under **continuous gas pressure** the CR tape must be reinforced as follows :

7.02 If the maximum diameter of the covering is 4 inches or less, apply two layers of half-lapped muslin and if the diameter is greater than 4 inches, apply three layers of half-lapped muslin, as illustrated below.



7.03 At Y openings secure the finished wrapping as shown below.



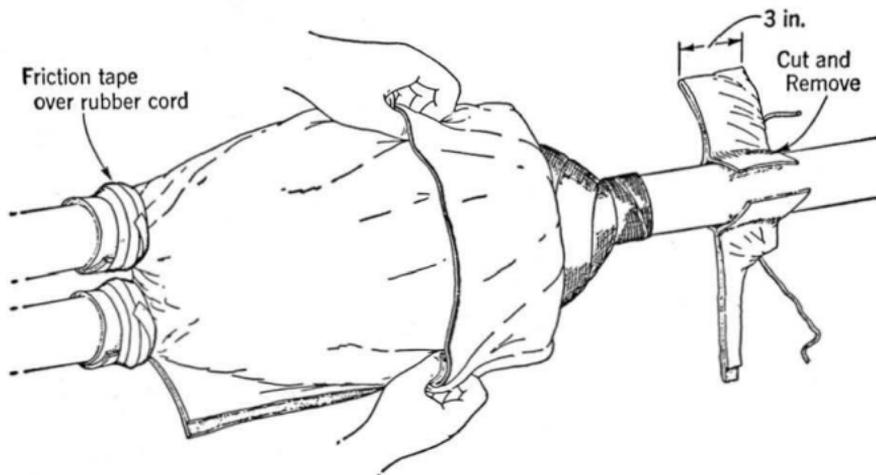
7.04 Replace the valve core and the valve cap and allow the gas to rise to the normal pressure in the cable. Examine the covering to determine whether there are any bulges in it. If a bulge occurs or if the wrapping does not appear safe, apply one or two additional layers of muslin to make sure that the covering will stand the gas pressure.

8. ADDITIONAL PROTECTION

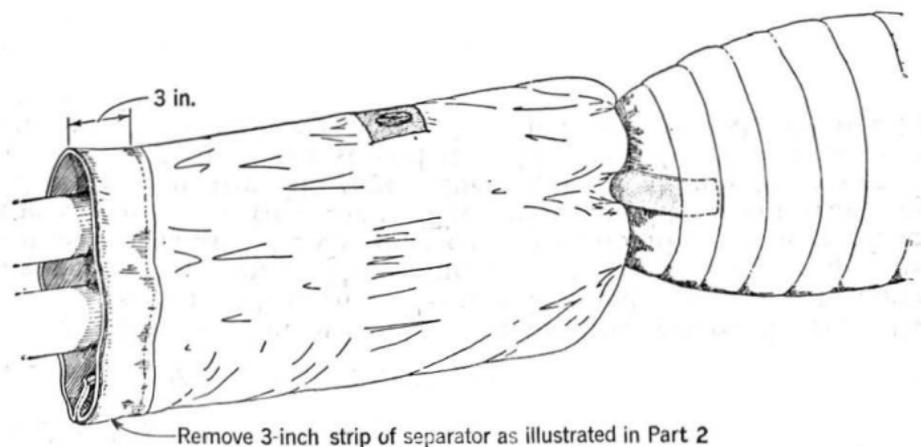
8.01 If a CR tape wrapping is to remain for some time, apply two half-lapped layers of friction tape over the outer muslin wrapping and then paint with No. 2 Asphalt Paint.

9. REMOVING CR TAPE FOR REUSE

9.01 If the CR tape covering is to be reused as outlined in Part 5, carefully remove the outer muslin wrapping. Then cut off the CR tape at one end and turn back the envelope, as illustrated below.



9.02 In replacing the tape, clean the sheath and wrap the splice in the usual manner. Remove about 3 inches of the separator as shown below, then replace the separator on the tacky surface.



9.03 Replace the CR tape envelope on the splice, remove the separator, and complete the CR tape covering as outlined in Part 4.

10. REMOVING PROTECTION

10.01 The muslin wrappings should be removed from the splice and, if the muslin is in good condition, it should be rolled for reuse. Houseline ties, friction tape wrappings, rubber cords and the CR tape covering should be removed from the splice by cutting them. The valve should be cut from the covering and any CR tape adhering to it should be removed. The base of the valve should then be cleaned with kerosene or gasoline. The rubber cords and rubber covering should not be reused.