BELL SYSTEM PRACTICES
Motor Vehicles and
Construction Apparatus

SECTION J6.506
Issue 1, August, 1950
AT&T Co Standard

WIRE ROPE
ROLLED EYES

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1. GENERAL

1.01 This section describes a method of forming an eye in the end of a wire rope. It replaces Specification 4737, Rolled Eyes for Winch Ropes.

1.02 An eye formed in accordance with the instructions in this section will develop approximately full strength of the rope.

1.03 The method of rolling eyes described herein is applicable to preformed wire rope in sizes from 3/16 inch to 1/2 inch, inclusive, and for ropes having either fiber cores or independent wire rope cores. The inherent liveliness of the wires in non-preformed rope makes the rolling of eyes extremely difficult.

1.04 The safety precautions outlined in Section J6.505 shall be observed in all cases when handling this rope.

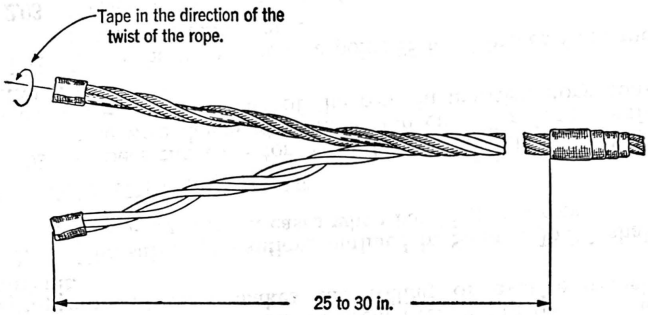
2. PREPARING THE ROPE

2.01 Inspect the rope for wear, broken strands, kinked or otherwise damaged sections and cut off a length sufficient to remove any part of the rope in unsatisfactory condition.

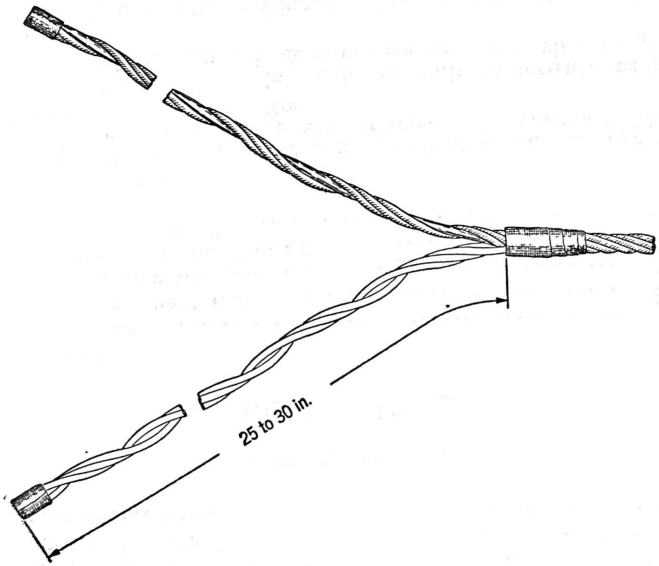
2.02 Serve the wire rope at a point 25 to 30 inches from the end with friction tape.

2.03 Separate the rope into two parts of three adjacent strands each for several rope lays and serve the end of each part with friction tape. The core is left in place in one of the parts. If the strands have become unwound in this process, they should be twisted back into their proper positions

before taping. Tape in the direction of the twist of the rope since this tends to tighten and to hold the strands in their original position.

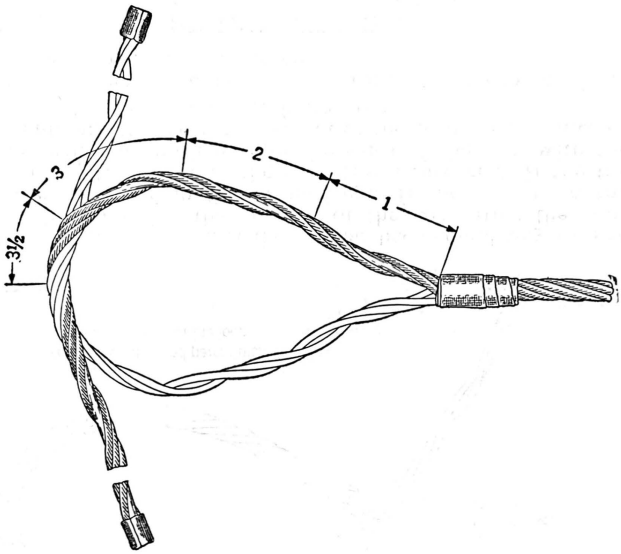


2.04 Separate the rope for the entire length to the tape.



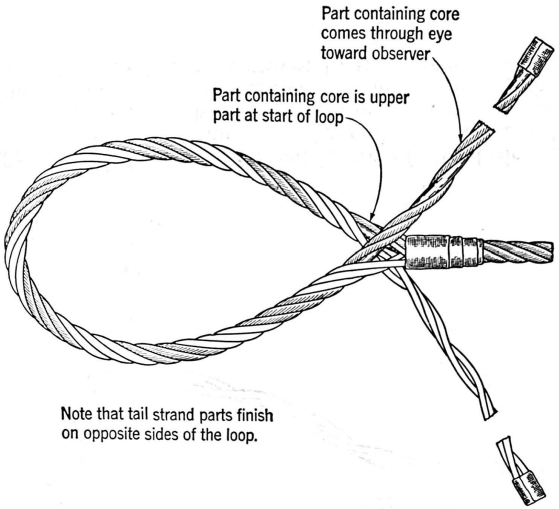
3. FORMING THE LOOP

3.01 Holding the two parts of the rope one in each hand, start the eye by making a simple overhand knot. The eye shall be started in such a way that the finished eye shall be at least 7 pitches in length. A 7-pitch eye is one which has 7 spirals of the strands entirely around the loop of the eye or 3-1/2 pitches to the center of the loop as shown in the following figure.



3.02 If the loop first formed is not of the desired number of pitches, it may be changed by loosening but not untying the knot. Apply a downward pressure on the rope ends, bending them toward the crotch of the eye and push or pull these ends until the knot moves to the proper pitch.

3.03 Wrap each part around the loop in such a manner that the strands will take the original form of the rope with each turn. Continue until the eye is completely formed.



3.04 Determine whether the eye has been completely formed by observing the position of the core after the rope has been split and in the finished eye. If the core is in the upper part of the rope at the start (see figure in 2.04) the tail strand parts will finish on opposite sides of the loop with the part containing the core coming out of the front of the finished eye toward the observer (see figure in 3.03).

3.05 Remove the tape from the rope at the crotch of the eye under the tail strands.

4. PREPARING THE TAIL STRANDS

4.01 Two methods of preparing the tail strands are satisfactory and either may be used. The strands may be distributed evenly around the rope or may be reformed into the original rope structure.

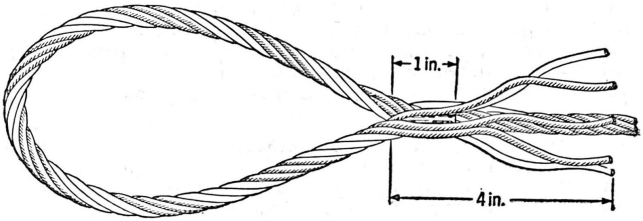
4.02 When the strands are distributed evenly around the rope and served, the resulting eye tapers smoothly.

4.03 When the strands are reformed into a rope, the resulting eye holds its shape better and is stronger, particularly in rope having an independent wire rope core, because

the strength of the core is utilized. However, there will be a protrusion on one side under the serving formed by the tail rope which in service may catch on obstructions if not carefully taped.

Tail Strands Evenly Distributed

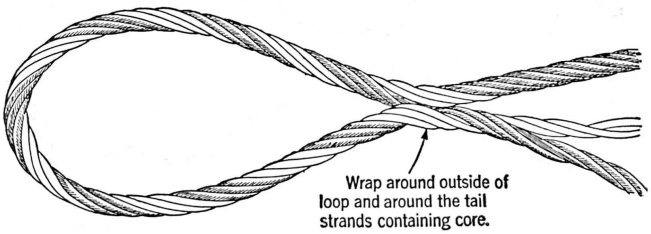
4.04 Tail strands of 4 inches or more are required to develop the full strength of the eye. Mark the strands at a point at least 4 inches from the crotch of the eye and cut off the excess.



4.05 Cut the core out about 1 inch below the crotch of the eye. Separate the tail strands and distribute them evenly around the rope.

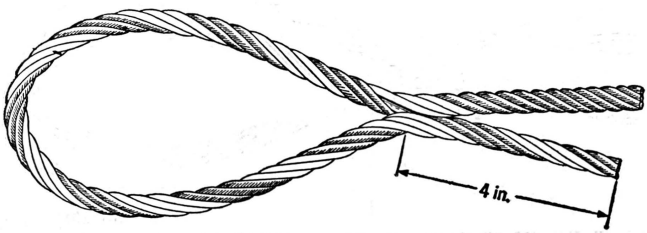
Tail Strands Reformed into Rope

4.06 Wrap the part of the rope not containing the core around the outside of the crotch of the eye and around the other tail strands which contain the core as shown in the following figure.



4.07 Lay the two tail strand parts together so that they assume the original form of the rope.

4.08 Tail strands of 4 inches or more are required to develop the full strength of the eye. Measure down 4 inches from the point where the tail strands are joined and cut off the excess.



5. SERVING THE EYE

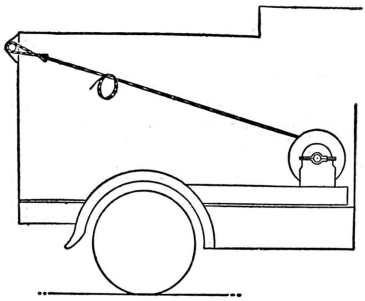
5.01 The importance of a tightly wound serving can not be overemphasized. A loose or improperly made serving may reduce the strength of the eye by as much as 40 per cent.

5.02 Use .065C Steel Lashing Wire. This wire is strong and yet flexible enough to provide a good serving. If this wire is not available, either .091B Steel Lashing Wire or .109 Steel Construction Wire may be used. These wires are quite stiff and are therefore more difficult to apply. However, if applied carefully to insure a tightly wound serving, they are just as satisfactory for developing the full strength of the eye as the .065C wire.

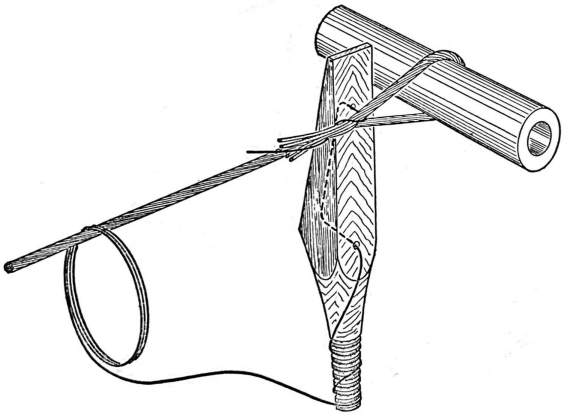
5.03 The use of a wooden pole bracket as a serving tool is recommended. If a pole bracket is not available, a piece of 1 x 2 hard wood about 12 inches long with two 3/16-inch diameter holes about 4 inches apart at one end will serve as a substitute. Using the pole bracket or the board will result in about 100 pounds tension in the serving wire, thus insuring a tightly wound serving.

Serving Procedure

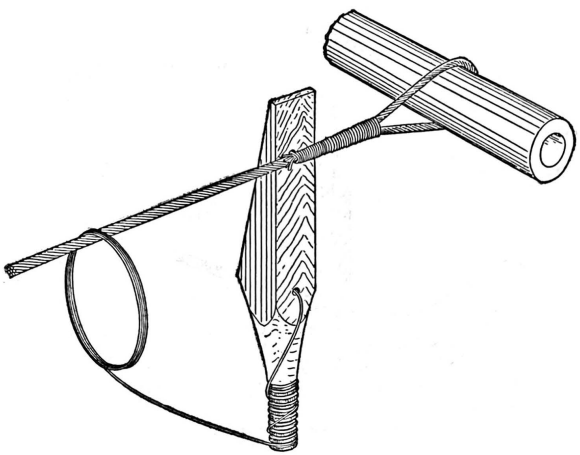
5.04 Place the coil of serving wire over the eye and onto the rope and put the eye under tension. Tension is best applied to the line by placing the eye over the spindle bar in the upper rear position and placing a slight strain on it with the winch. In this position, the eye is readily accessible for serving. Care must be taken not to apply too much winch load, as it might damage the body.



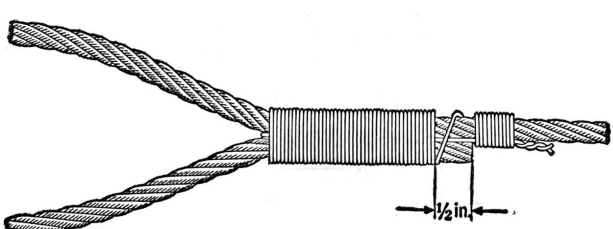
5.05 Thread the serving wire through the holes in the pole bracket and wind it twice around the handle or pin. The free end of the serving wire is passed through the crotch of the eye and wound loosely around the tails and down to solid rope.



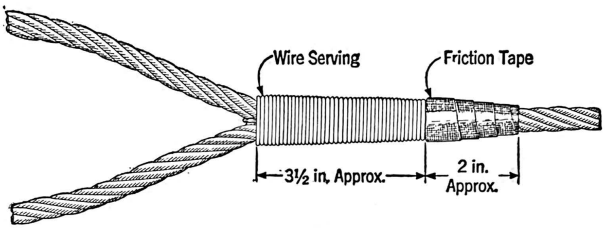
5.06 Begin serving by rotating the tool in the direction of the twist in the rope. Maintain a constant pressure on the wraps around the pin end of the bracket to provide sufficient snubbing for a tight serving.



5.07 Continue placing the serving wire over the tails in close, tightly wound coils to a point about 1/2 inch short of the ends of the strand tails. Spiral the wire down to solid rope and finish the serving with about 10 wraps on the rope. Pigtail the ends of the serving wire.



5.08 Leaving the last 1/2 inch of tails unserved helps to keep the serving wire from slipping off the tails and loosening when the line is under tension. It is advisable to tape over the unserved portion of the tails and the final serving on the solid rope only. This protects the workmen from the tail strands, gives a fairly smooth taper at this point and still leaves the majority of the serving exposed for observation.



5.09 Under no circumstances shall friction tape be used in place of the wire serving. The use of friction tape under the wire serving will weaken the eye and should not be used.