

SUSPENSION STRAND PULLING UP AND TENSIONING

CONTENTS	PAGE
1. GENERAL	1
2. PRECAUTIONS	1
3. FINAL CHECKS BEFORE TENSIONING	1
4. PULLING UP AND TENSIONING STRAND	2

1. GENERAL

1.01 This section covers the method of pulling up and tensioning suspension strand, precautions, final checks before tensioning, and a method of providing safeguards when making heavy pulls.

1.02 This section is reissued to add information concerning the equipment capacities required for tensioning or holding suspension strand under various load conditions.

1.03 The methods to be used in deadending suspension strand are covered in Section 627-240-212.

1.04 The pulling up and tensioning of self-supporting cable is covered in the 627-700 Sub-Division.

2. PRECAUTIONS

2.01 Insulating gloves must be worn and body contact avoided by all workmen handling suspension strand or any apparatus which may contact the strand during tensioning operations on jointly used pole lines or on nonjoint sections involving power crossings.

2.02 Any temporary grounds that are installed during strand placing operations shall be left in place until the strand is tensioned and deadended.

2.03 The tools used in pulling up and tensioning strand, such as strand pullers, chain hoists, rope slings, winch lines, and blocks and

tackle, shall be in good working condition and shall be used as outlined in the various sections of the 081 Division Plant Series Practices covering their use and maintenance.

2.04 *Do not exceed the "Safe Working Load" prescribed for the various chain hoist capacities as shown in Tables A and B.*

2.05 Do not leave a chain hoist under tension for extended periods of time, such as from one workday to the next.

2.06 Proper clearances, as outlined in Division 620 of the Plant Series Practices, must be assured at all power crossings, jointly used poles, and road crossings, before strand tensioning operations are started.

2.07 Care must be exercised to prevent the introduction of excessive slack in power conductors when tensioning strand on jointly used lines. If a noticeable increase in slack is observed in the power conductors at any time, stop work operations and notify the supervisor. Arrangements must be made to have the excess slack removed from power conductors by the power company.

3. FINAL CHECKS BEFORE TENSIONING

3.01 After slack has been removed and before final tensioning of suspension strand, make the following checks.

(a) Observe the entire line and free the strand from all snags and obstructions.

(b) Recheck the line for proper clearances at all power crossings, jointly used poles, road crossings, etc.

(c) The strand must be in the groove of the suspension clamps at all corners, changes in grade, power crossings, and road crossings. Clamps should be loose enough to permit free movement of the strand.

(d) After checking for proper clearances ascertain that any rope ties which were placed to prevent the strand from flipping up at power crossings are of sufficient length to permit the strand to reach the proper level during the final tensioning operation.

(e) Establish adequate communications between the workman who is to do the final tensioning and the workman who is to check the strand tension with a strand dynamometer.

4. PULLING UP AND TENSIONING STRAND

4.01 Suspension strand may be pulled up by means of a chain hoist, winch line, or block and tackle, as illustrated in Fig. 1 through 6.

No Cable in Place

4.02 When suspension strand without cable is to be tensioned, the proper stringing tension may be found in Section 627-210-011 and the pulling equipment selected accordingly.

4.03 Some examples of the equipment capacity required for tensioning suspension strand with no cable in place are shown in Table A.

Cable in Place

4.04 When suspension strand with cable in place is to be held or tensioned, the strand tension may be found in Sections 627-210-012 to 627-210-017, inclusive, and the pulling equipment selected accordingly. Some examples of the equipment capacity required for the various strand sizes are shown in Table B.

Table A — Equipment Capacity Required for Tensioning Strand — No Cable in Place

Strand Size	Pulling Equipment Type & Capacity	Safe Working Load (Pounds)	Strand Puller		Connecting Link	
			Size	Safe Working Load (Pounds)	Size (Inches)	Safe Working Load (Pounds)
2.2M	Hoist 3/4 ton	1500	L	5,000	3/8	1500
6 M	Hoist 3/4 ton	1500	L	5,000	3/8	1500
10 M	Hoist 1-1/2 ton	3000	L	5,000	1/2	3000
16 M)	Hoist 3 ton	6000	L	5,000	None)	See
25 M)	Winch Line 7/16"	—	H	10,000	None)	Fig. 3

Table B — Equipment Capacity Required for Tensioning or Holding Suspension Strand — Cable in Place

Strand Size	Pulling Equipment Type & Capacity	Safe Working Load (Pounds)	Strand Puller		Connecting Link	
			Size	Safe Working Load (Pounds)	Size (Inches)	Safe Working Load (Pounds)
2.2M	Hoist 3/4 ton	1500	L	5,000	3/8	1500
6 M	Hoist 1-1/2 ton	3000	L	5,000	1/2	3000
10 M	Hoist 3 ton	6000	H	10,000	3/4	6000
16 M	Hoist 3 ton (See Note 1)	6000	H	10,000	3/4	6000
16 M)	Winch Line	See Section	H	10,000	None)	See
25 M)	Double (see Fig. 3)	649-310-011	H	10,000 (See Note 2)	None)	Fig. 3

Note 1: Use only when cable weight is 1 pound per foot or less.

Note 2: If tension exceeds 10,000 pounds, use strand loop as shown in Fig. 5.

4.05 Where a chain hoist is used, attach the sling to permit the hoist to pull as nearly as possible in line with the strand attachment and still leave working room for making the deadend as illustrated in Fig. 1.

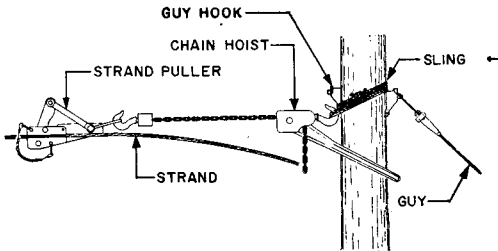


Fig. 1 – Pulling Up Strand – Chain Hoist Method

4.06 For heavy pulls and for tensioning long sections of strand where a considerable amount of slack is to be removed, the winch line should be used, if possible. Where the winch line is used, it should be rigged as illustrated in Fig. 2 for 6M or 10M suspension strand, and as illustrated in Fig. 3 for 16M or 25M suspension strand. Where a connecting link is used on the winch line, as shown in the alternative method in Fig. 2, use a size which will not permit the safe working loads specified in Tables A and B to be exceeded.

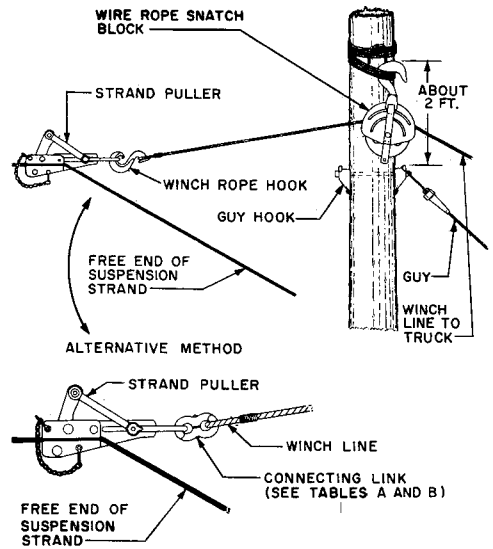


Fig. 2 – Pulling Up 6M or 10M Suspension Strand – Winch Line Method

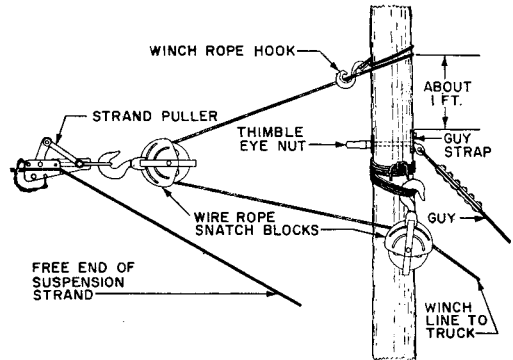
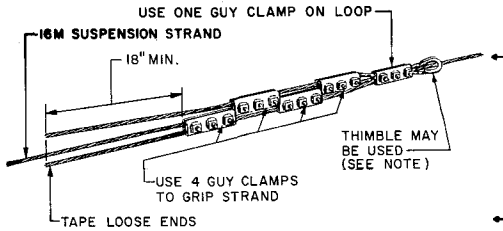


Fig. 3 – Pulling Up 16M or 25M Suspension Strand – Winch Line Method

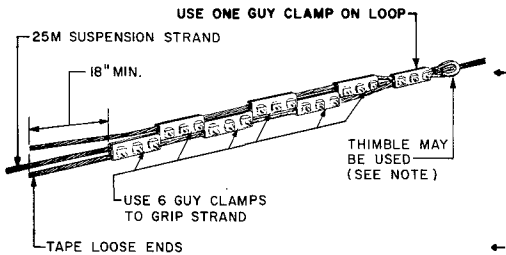
4.07 When pulling or holding suspension strand with cable in place over highways, schoolyards, railroads, etc, or where the tension is in excess of 10,000 pounds, a strand loop as illustrated in Fig. 4 and 5 shall be used in place of the strand puller

Note: A B Strand Grip or B False Deadend should never be used for making this temporary attachment.



NOTE: USE 16M STRAND FOR THE LOOP. TAILS OF LOOP SHALL EXTEND AT LEAST 18 INCHES BEYOND THE LAST CLAMP.

Fig. 4 - Strand Loop - 16M Suspension Strand



NOTE: USE 25M STRAND FOR THE LOOP. TAILS OF LOOP SHALL EXTEND AT LEAST 18 INCHES BEYOND THE LAST CLAMP.

Fig. 5 - Strand Loop - 25M Suspension Strand

4.08 Where blocks and tackle are used, they should be rigged as illustrated in Fig. 6.

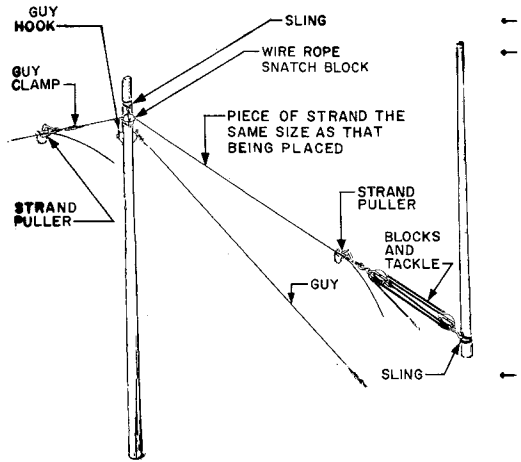


Fig. 6 - Pulling Up Strand - Block and Tackle Method

4.09 Where long sections of strand are to be placed, the following methods may be used.

- (a) Pay out first reel of strand and deadend it permanently at the first pole.
- (b) Pull up the strand from the first reel to the required tension and hold the tension with a hoist and strand puller or a temporary false deadend as illustrated in Fig. 7. A temporary false deadend should be used in all cases for 16M or 25M strand or where it will be necessary to maintain tension for an extended period of time (such as from one work-day to another, etc).
- (c) Pay out the second reel of strand and splice to first reel.
- (d) Tension strand from second reel.

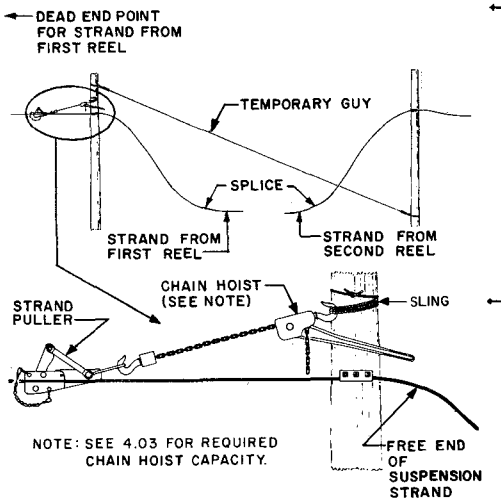


Fig. 7 — Holding Tension for Splicing Strand

4.10 An alternate method of pulling up strand and temporarily maintaining tension is illustrated in Fig. 8 for 6M or 10M strand, and Fig. 9 for 16M strand. **Do not leave a chain hoist under tension for an extended period of time or in a location where it is accessible to the public.**

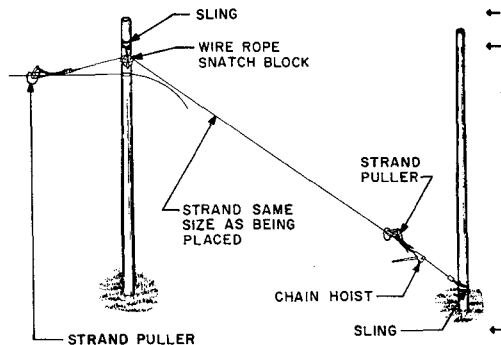


Fig. 8 — Alternate Method of Maintaining Tension for 6M or 10M Strand

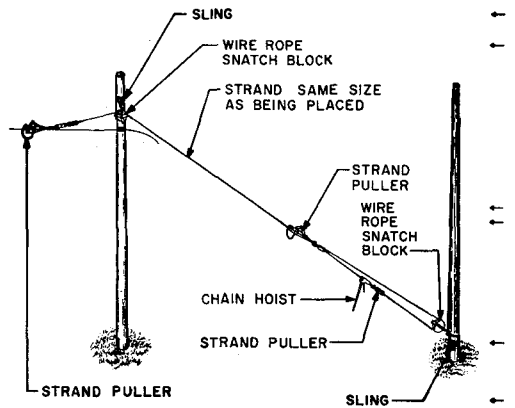


Fig. 9 — Alternate Method of Maintaining Tension for 16M Strand

4.11 Where two reels of 6M or 10M suspension strand are to be placed and they can be permanently deadended at the first and last poles of the section, they may then be tensioned and spliced at an intermediate pole as follows.

(a) Tension both strands at the same time as illustrated in Fig. 10. Leave rope lashing loose enough to allow movement of chain through the loop to equalize tension of the two strands.

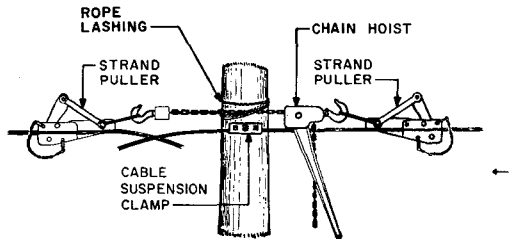


Fig. 10 — Final Tension — Two Reels of 6M or 10M Strand

- (b) Splice the strand. Leave at least 12 inches between the near end of the splice and the end of the cable suspension clamp.
- (c) Place the strand in the suspension clamp and tighten the bolts only enough to support the strand.
- (d) Release tension on the chain hoist slowly until the splice is under tension.
- (e) Remove the chain hoist and strand pullers and securely tighten the bolts on the cable suspension clamp.

4.12 Occasionally, because of corners in the line or tree conditions, or where using large reels of strand, it is advisable to pull slack out of the strand at intermediate points preparatory to the final tensioning of the strand. At these points, the method illustrated in Fig. 11 may be found convenient for temporarily holding the strand. This method shall only be used as a

means for holding light unbalanced loads in the strand and shall *never* be used for holding unbalanced loads as high as the recommended strand stringing tensions.

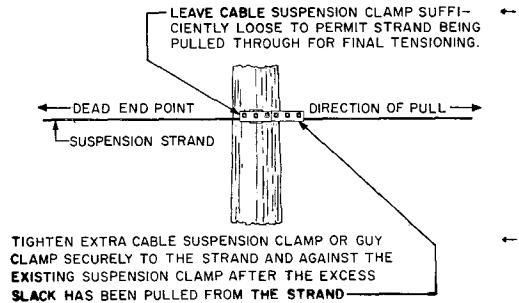


Fig. 11 — Holding Tension for Removing Slack Under Light Unbalanced Load