BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G52.123.4
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AT&T Co Standard

PRELASHING
E CABLE LASHER

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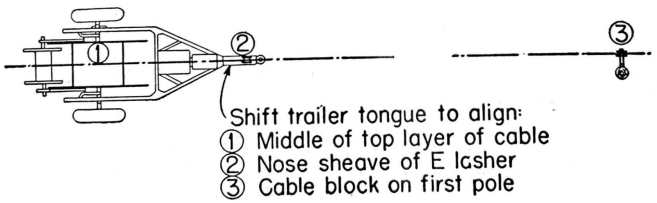
1. GENERAL

1.01 This section covers the operation and use of the prelashing equipment.

2. ALIGNMENT

2.01 Sighting from **behind** the trailer, shift the tongue end of the trailer as required to bring the middle of the top layer of cable on the reel, the sheave on the nose of the E cable lasher, and the first block on pole into alignment.



2.02 Place **large** wheel chocks in front of both trailer wheels and if the pulling tension is to exceed 1500 pounds or the tongue of the trailer is pointing downgrade, temporarily guy the trailer to a pole, tree or other secure attachment behind the trailer.

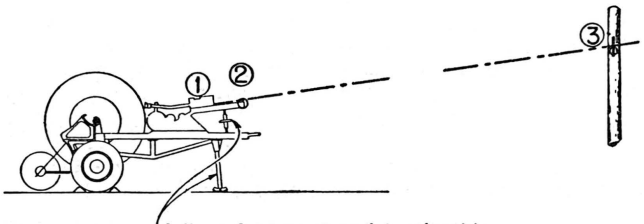
2.03 Sighting from the **side** of the trailer, raise or lower the front end of the trailer as required to align the center of the C cable lasher, the top of the nose sheave of the E cable lasher, and the top of the E cable block. This adjustment is made as follows:

(1) Raise or lower the trailer tongue to the desired height using the hydraulic jack.

(2) Lower the trailer foot post and place pin in the adjusting hole nearest the proper elevation.

(3) Release the hydraulic jack and retract it.

(4) Align the sheave on the nose of the lasher by means of the turnbuckle adjustment supporting the lasher mounting. The turnbuckle should be used for minor adjustments only, and should not be extended more than absolutely necessary.



Adjust foot post and turnbuckle to align:
① Center of C Lasher
② Top of nose sheave
③ Top of E Cable Block

(5) **After the pull has started,** adjust the position of the nose sheave so that the prelashed strand and cable are bearing **lightly** on the nose sheave. A light pressure on the nose sheave is necessary to remove excess load from the C lasher; a heavy pressure on the sheave may result in loose lashing.

3. INITIAL ADJUSTMENTS OF E LASHER

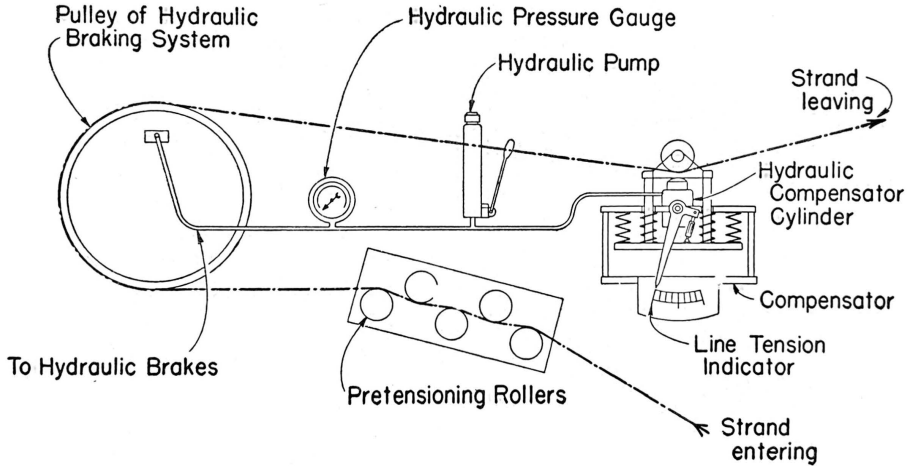
3.01 Since aerial cable expands and contracts more than its supporting strand, precautions must be taken to avoid introducing excess cable at the time of placing. In the prelashing method, cable tensioning arrangements used with other lashing methods can not be employed. Excess cable is

avoided by proper adjustment of the cable reel brake and by pulling in at low strand tension (about 2/3 to 3/4 of final tension at temperatures above 60°F., and about 1/2 of final tension for temperatures of 60°F. and less) and then pulling the strand up to final tension. By final tension is meant the strand tension with cable in place as shown in the G51 series.

3.02 Strand tension is applied in two steps, by the pretensioning rollers and the hydraulic brake and compensator, respectively.

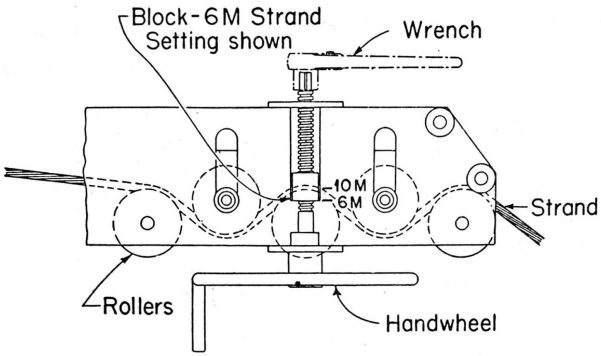
(a) The pretensioning rollers apply a uniform initial load for a particular size of strand. The load is caused by the strand bending as it passes through the rollers.

(b) The hydraulic brake and compensator provide the load in excess of the initial load required to obtain the necessary strand tension. The binding effect of the preloaded strand on the pulley causes the pulley to turn against the resisting force of the brakes. The desired braking effort is obtained by controlling the hydraulic pressure applying the brakes. It is desirable to maintain the strand tension at a relatively constant level throughout the pull. The compensator automatically varies the hydraulic pressure controlling the braking effort and tends to offset line tension variations. Two indicators, a hydraulic pressure gauge calibrated in line tension to give an indication that the hydraulic braking system is functioning, and a line tension indicator which more accurately measures the tension in the strand, are provided.


Pulley of Hydraulic Braking System
Hydraulic Pressure Gauge
Hydraulic Pump
Strand leaving
Hydraulic Compensator Cylinder
Compensator
Line Tension Indicator
To Hydraulic Brakes
Pretensioning Rollers
Strand entering

3.03 The procedure for obtaining the desired strand tension is as follows:

(1) Using the hand wheel or the ratchet wrench provided, adjust the pretensioning rollers to the mark on the guide indicating the size of strand being used.

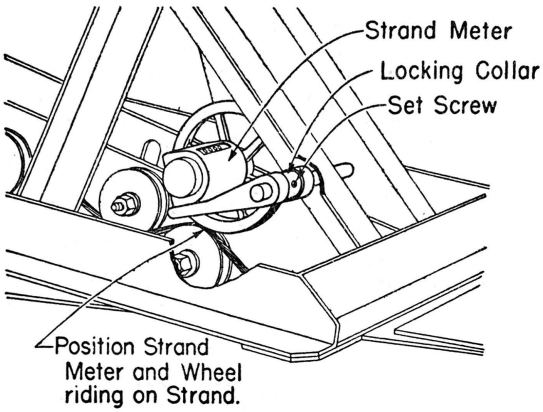


STRAND PRETENSIONING ASSEMBLY

(2) Start the pull **slowly.** Operate the hydraulic pump while the strand is in motion until the **line tension indicator** registers the desired tension. If the line tension is higher than desired, reduce the hydraulic pressure by opening the release valve on the hydraulic pump a small amount and closing it when the **line tension indicator** reads the desired tension.

3.04 It should be noted that Step 1 above is a preliminary setting which is made prior to starting the pull whereas Step 2, the final operation necessary to obtain the desired tension, can **only** be made while the pull is in progress. It is not possible to make accurate tension adjustments if the strand is not passing through the equipment.

3.05 Set the strand meter at "0" and place it in the operating position with the wheel riding on the strand. When not in use, the strand meter should be wrapped in a protective cloth and carried in the tool box.



The strand is measured as it passes through the prelasher to provide a means of determining when the lashing wire is running out. As the end of the coil approaches, the prelashing operation is stopped, the lashing wire is gripped to the strand and cut at the lasher. Join the lashing wire to the new coil by tying a square knot and turning back the ends so that the cable sheath will not be injured. A full coil of lashing wire will prelash 1100 to 1150 feet of strand and cable depending on the cable diameter.

4. PULLING IN PRELASHED CABLE

4.01 Before starting the pull, check the setup with particular emphasis on the following:

(a) Trailer properly positioned and aligned.

(b) Trailer chocked with large chocks and, if necessary, guyed.

(c) Cable reel brake and strand reel brake set.

(d) Equipment and C cable lasher properly rigged and strand meter set.

(e) Initial tension adjustments correct for strand size and pulling tension.

(f) All communicating equipment functioning properly.

4.02 Start the pull **slowly** and adjust the line tension as outlined in Paragraph 3.03, Step 2, until the **line tension indicator** indicates the desired pulling tension.

4.03 Check the strand reel brake and the cable reel brake and readjust them if necessary. Brakes should be tight enough to give the minimum uniform drag which will prevent overrunning.

4.04 Maintain a constant line tension throughout the pull. It may be necessary to make some adjustments of the hydraulic pressure during the pull in order to maintain the desired reading on the line tension indicator. **Make these adjustments while the strand is in motion.**

4.05 It may be necessary to readjust the pretensioning rollers. The initial load imparted by the rollers depends on the amount of bending introduced into the strand.

(a) On heavy pulls there may be a tendency for the strand to slip on the large brake pulley. This can be overcome by tightening the pretensioning rollers a small amount to increase the initial load.

(b) On light pulls, the initial load provided by the pretensioning rollers may equal the desired line tension. Under these conditions the pretensioning rollers should be loosened to reduce the initial load and the hydraulic system pumped up until the correct line tension is obtained. It is always necessary to have part of the load developed by the hydraulic braking system in order to obtain the necessary compensating action to minimize surging.

4.06 A man carrying a radio set or signaling device should keep abreast of the cable leader during the pull. Observe carefully for the following:

(a) At the start of the pull check the chuck joining the strand to the cable leader. If any slippage is noted stop the pull and replace the connector.

(b) A uniform pulling speed, usually 130 to 150 feet per minute, should be maintained. It may be necessary to vary the speed to reduce surging in the line.

(c) As the cable leader leaves each temporary roller observe to see that the weights are hanging in the proper position. If the weights are not in this position, bring them into position.

(d) Observe the leader throughout the pull. Should it turn over (twist) the pull must be stopped before the leader enters the next temporary roller and the leader rotated to its normal position (untwisted). If this is not done there will be a permanent twist of the cable around the strand.

(e) Watch for obstructions, damaged rollers, etc., that may necessitate stopping or slowing the pull.

4.07 Strand may be brought up to final tension during the prelashing operation or it may be brought up to final tension with a chain hoist and strand puller. Final tensioning during the prelashing operation is preferred and should be done in the case of a single pull as follows:

(1) As the cable leader enters the last span reduce pulling speed and increase brake pressure slowly by operating the hydraulic pump until the line tension indicator registers the desired final tension. In practice it has been found desirable to get about 100 pounds or so higher tension to compensate for slight loss of tension due to strand terminating operations.

(2) In approaching the end of the pull, keep in mind that in some cases the length of strand required to make the termination may be controlling whereas in other cases the amount of cable overlap required may be controlling. Stop the pull when sufficient strand and cable are available for termination.

4.08 Where the final strand tension with the cable in place exceeds 3000 pounds it is usually advisable to complete the pull at the lower pulling tension, temporarily dead-end the prelashed assembly at the first pole from the trailer and pull the assembly to its final tension with the truck winch. Measure the final tensions with a strand dynamometer.

4.09 To free the truck and the trailer, the strand should be dead-ended temporarily or permanently.

4.10 Should it be necessary to pull in lengths of prelashed strand and cable longer than can be handled by the length of winch line on the pulling truck, the first part of the pull can be temporarily dead-ended at the last pole at the truck end and the cable leader detached from the winch line. The pulling truck can be moved to the end of the length and the winch line threaded through the remaining rollers and attached to the cable leader, the tension applied, the temporary dead-end removed and the pull completed. The brake setting at the prelashing trailer should not be released during the operation.

4.11 Do not allow all of the strand to pay off of the strand reel during a pull. A minimum of ten turns of strand on the reel is necessary to maintain strand tension.

4.12 To join two lengths of cable which have been wound on the same reel or pieces of a length of cable which has been cut, stop the pull when the end of the first length has passed the nose sheave of the prelasher. Temporarily clamp the lashing wire several feet ahead of the end of the cable, cut the lashing wire and unwind it to the C lasher. Thread the second length of cable through the prelasher and overlap the first length sufficiently to allow the cables to be spliced later. Tape the two cable ends together but **do not include the strand.** The cable ends should be tapered smoothly with tape to remove projections which could catch in the temporary rollers. Pull sufficient lashing wire from the C lasher, hand lash the cables to the strand, join the lashing wires, remove the temporary clamp and resume the pull.