

Application Engineering Note

Distribution Cable Pulling Grip Installation Procedure

Scope:

The scope of this procedure is to describe how to properly install a cable pulling grip on an Optical Cable Corporation Distribution Series (DX) fiber optic cable.

Procedure:

Optical Cable Corporation recommends using pulling grips, with or without swivel eyes, for all distribution cables *and* using a breakaway swivel rated for the proper installation tensile load of the cable being installed. The pulling grip should be sized appropriately for the diameter of the cable. Kellems pulling grips are recommended. Listed below are the model numbers for the Kellems pulling grips with and without the swivel eyes and the corresponding cable diameters.

<u>Kellems Model #</u>	<u>Cable Diameters</u>
<i>With Swivel</i>	
033291007	.10 - .22 inches
033291008	.21 - .35 inches
033291009	.32 - .48 inches
033291010	.42 - .61 inches
033291011	.53 - .74 inches
033291012	.64 - .87 inches
<i>Without Swivel</i>	
033291193	.10 - .22 inches
033291194	.21 - .35 inches
033291195	.32 - .48 inches
033291196	.42 - .61 inches
033291197	.53 - .74 inches
033291198	.64 - .87 inches
033291199	.75 - 1.00 inches

When preparing a DX cable for pulling into a duct or tray, care must be taken to properly attach the pulling grip to the cable.

Most normal pulls will utilize the Standard Pull procedure for attaching a pulling grip to a DX cable. For some tough installations where the cable will be expected to experience full tensile rating during installation, the Difficult Pull attachment may be needed.

Standard Pulls

The Standard Pull procedure allows the cable grip to be placed directly onto the cable end.

Optical Cable Corporation recommends applying friction tape, 3M 88T Electrical Tape or a suitable substitute over the outer jacket of the cable prior to installing the pulling grip. This procedure can be done by measuring the length of the grip, marking the cable where the end of grip will be on the cable, and then applying the tape over the cable (see Figures 1, 2, and 3).

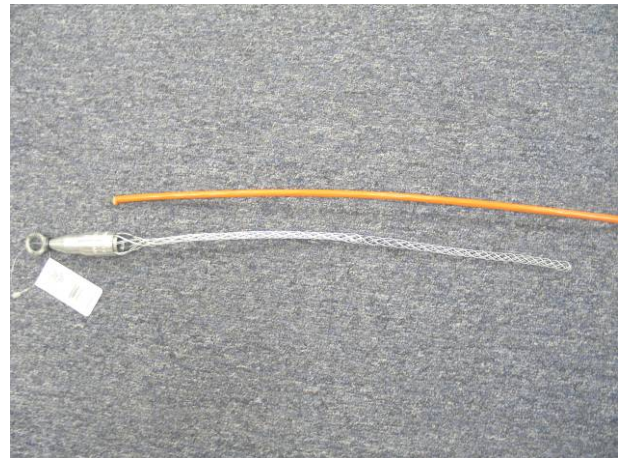


Figure 1: Measure Pulling Grip

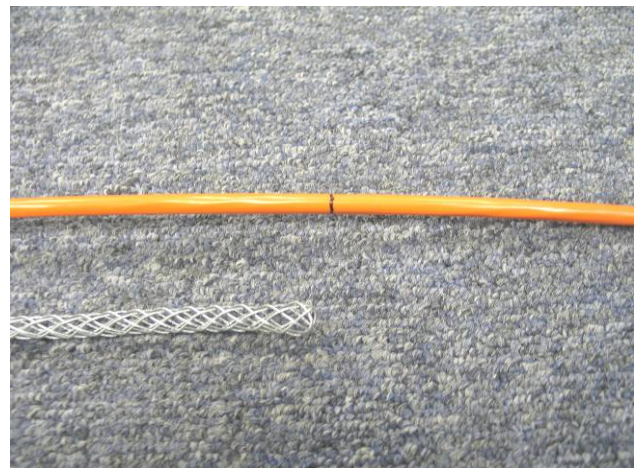


Figure 2: Marking Cable

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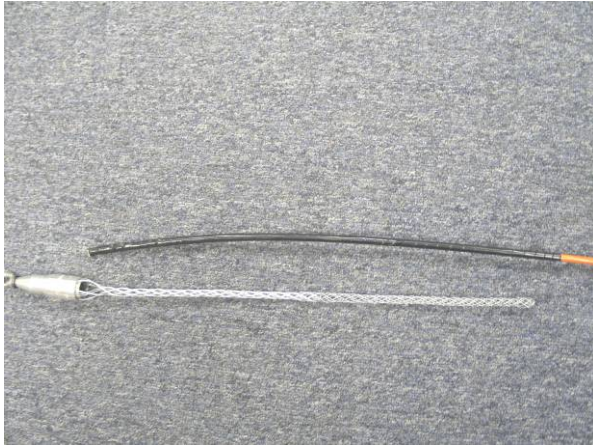


Figure 3: Tape Cable Up to or past Mark on Cable

The pulling grip should then be inserted onto the cable that is covered by the tape (see Figure 4).



Figure 4: Pulling Grip Installed on Cable

3M 88T Electrical Tape or a suitable substitute should then be applied over the pulling grip (see Figure 5).



Figure 5: Tape applied over pulling grip

Difficult Pulls

The Difficult Pull procedure may be needed for secure attachment for some installations where the cable will be expected to experience full tensile rating during installation.

Step 1: The length of the grip is measured along the length of the cable and the cable marked where the end of grip is located (See Figures 6 and 7).

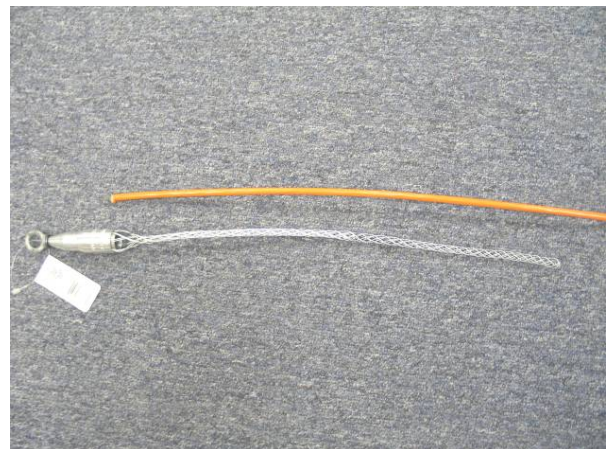


Figure 6: Measure Pulling Grip

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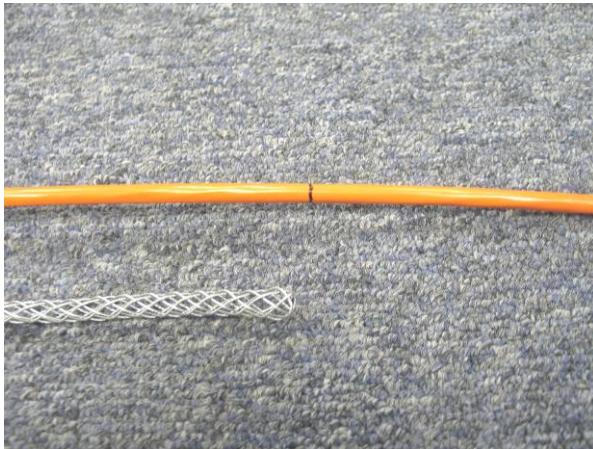


Figure 7: Marking Cable

Step 2: The length of the grip should be measured from the first mark and the cable marked (second mark) to show the length of the pulling grip (See Figure 8).

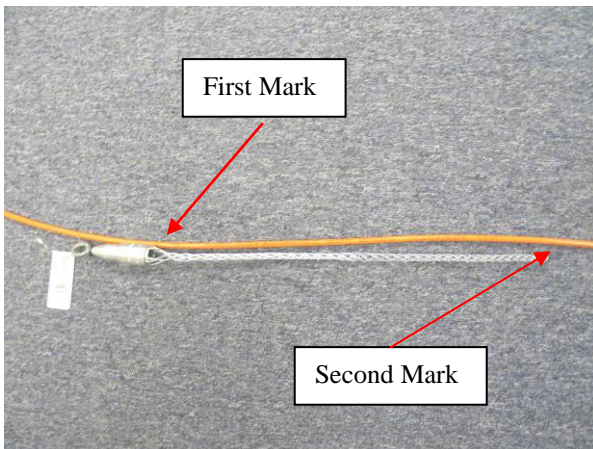


Figure 8: Measuring Pulling Grip from First Mark

Step 3: Using 3M 88T Electrical Tape or a suitable substitute, the cable should be taped between the first and second marks (See Figure 9)

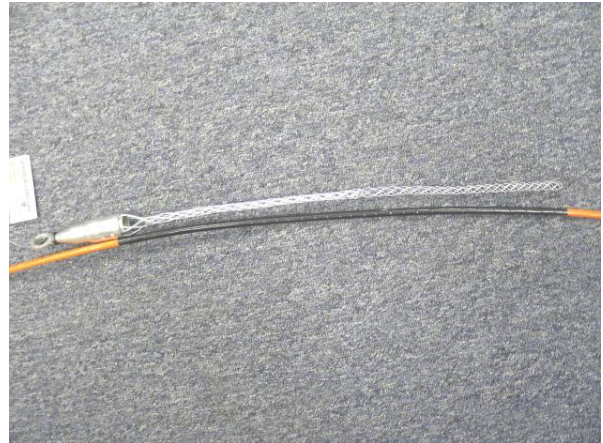


Figure 9: Apply tape from first mark second mark

Step 4: Determine if the diameter of the cable will allow for the cable to protrude through the end of the pulling grip. If the cable can protrude through the end of the pulling grip, continue on to Step 4. If not, then skip to Step 10.

Step 5: The pulling grip should then be inserted onto the cable that is covered by the tape. The excess length on the inner cable (from first mark to the end of the cable) should pass through the end of the grip up to where the tape wrap starts (see Figures 10 and 11).



Figure 10: Excess Cable Pulled Through the End of the Pulling Grip

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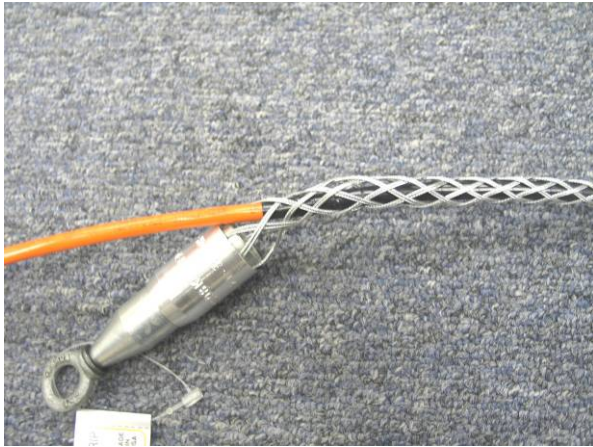


Figure 11: Pulling grip is inserted onto the cable

Step 6: Once the cable has been inserted into the pulling grip, the jacket on the protruding cable should be removed and the strength elements should be separated from the buffers and central member (See Figure 12).

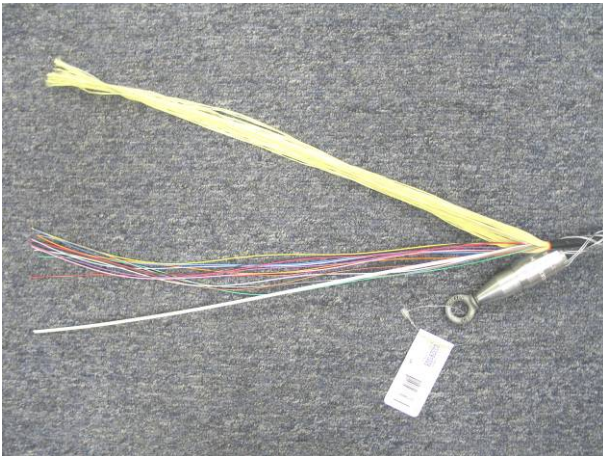


Figure 12: Outer Jacket Removed and Strength Elements Separated

Step 7: The buffers and central member should then be cut off leaving only the aramid yarn strength elements. The strength element should then be folded back onto the grip (See Figure 13).

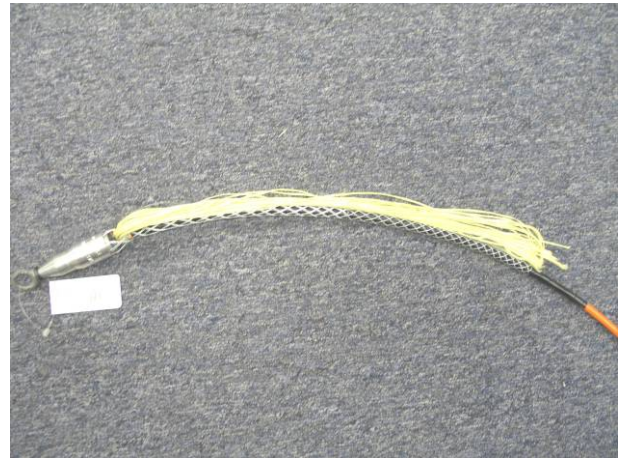


Figure 13: Buffers and Central Member Removed and Strength Elements Folded Back On Pulling Grip

Step 8: 3M 88T Electrical Tape or a suitable substitute should then be applied over the pulling grip (see Figure 14).



Figure 14: Tape applied over pulling grip

Step 9: The pulling grip installation is complete.

Steps 10 through 14: Use only when the diameter of the cable will not allow for the cable to protrude through the end of the pulling grip.

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Step 10: The outer jacket must be removed from the first mark towards the end of the cable (See Figure 15).

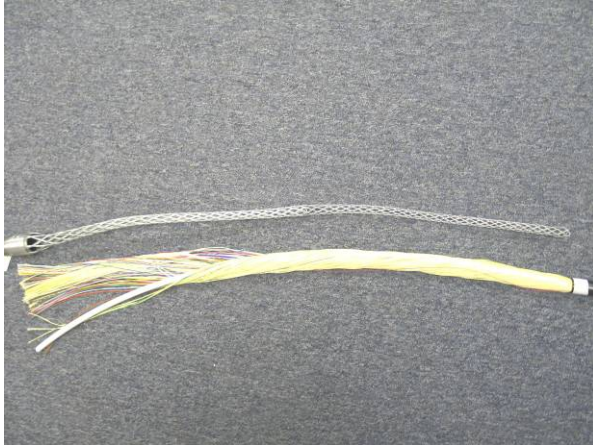


Figure 15: Outer Jacket Removed from First Mark to End of Cable

Step 11: The central member should be separated from the buffers and strength elements. The central member should be removed (See Figures 16 and 17).



Figure 16: Central Member Separated from Buffers and Strength Elements

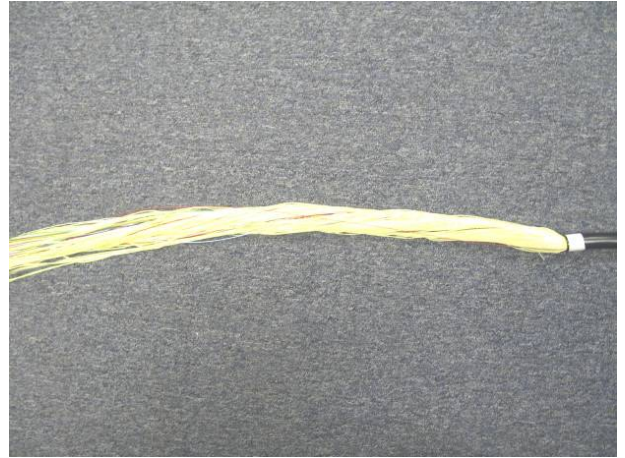


Figure 17: Central Member Removed

Step 12: Using 3M 88T Electrical Tape or a suitable substitute, the strength elements and buffers should then be covered (See Figure 18).

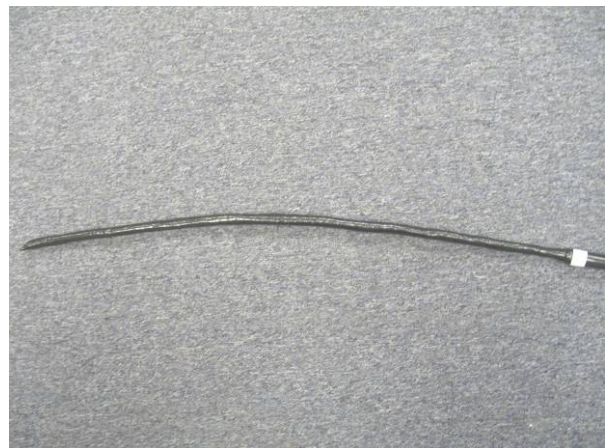


Figure 18: Strength Elements and Buffers Covered with 3M 88T Electrical Tape

Step 13: The pulling grip should then be inserted onto the cable that has an outer jacket and is covered by the tape, allowing the taped strength elements and buffers to protrude through the end of the pulling grip (See Figures 19 and 20).

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Figure 19: Taped Strength Elements and Buffers Passing Through the End of the Pulling Grip



Figure 20: Taped Strength Elements and Buffers Folded Back onto the Grip

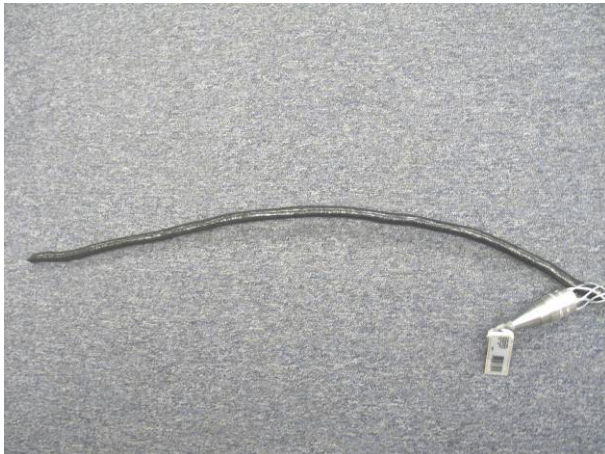


Figure 20: Taped Strength Elements and Buffers Passing Through the End of the Pulling Grip



Figure 20: Taped Strength Elements and Buffers Folded Back onto the Grip and Taped

Step 14: The taped strength elements and buffers should then be folded back onto the grip and 3M 88T Electrical Tape or a suitable substitute should then be applied over the pulling grip (see Figures 21 and 22).

Breakaway Swivel

After the pulling grip has been installed, a breakaway swivel should then be installed on the pulling grip before the cable is pulled. Optical Cable Corporation strongly recommends using a breakaway swivel on all pulling grips, whether the pulling grips have or do not have a swivel eye. The breakaway swivel must be rated no more than the maximum installation tensile load of the cable.



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After Installation

Once the cable has been installed, remove the pulling grip and cut off at least 3 feet of the end of the cable where the pulling grip was attached.

If you have any questions, please contact the Optical Cable Corporation's Engineering Department at (540) 265-0690.

Shipping Address:
5290 Concourse Drive
Roanoke, VA 24019
USA

Phone 540-265-0690
Fax 540-265-0724
Sales Dept. 1-800-622-7711
www.occfiber.com

Mailing Address:
P.O. Box 11967
Roanoke, VA 24022-1967
USA