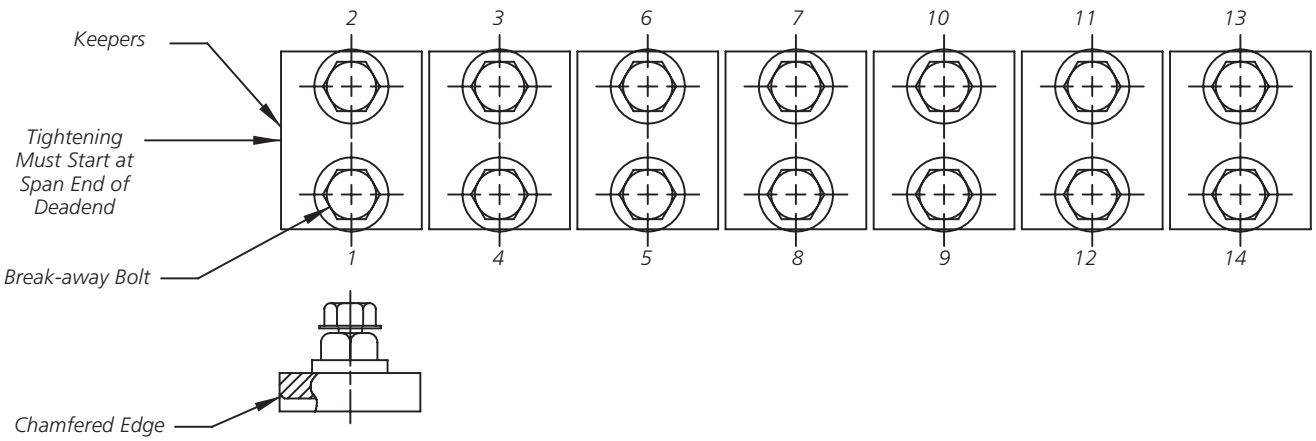
Installation Instructions for OPGW Bolted Dead End

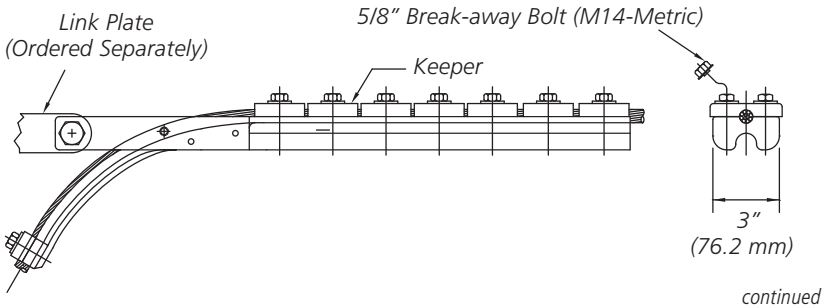
Procedure

1. Disassemble dead end. Remove one bolt from the same side of each keeper. Loosen other bolts to permit conductor to be placed in the conductor groove. If keepers and bolts are removed completely, care must be taken to return the keeper closest to the span end of the dead end to its original position (chamfered edge towards span). Remove clevis hardware.
2. Straighten conductor removing set caused by reel.
3. Place conductor into groove and install dead end keepers with washers break-away bolts.
4. Care should be taken during installation to maintain the keepers squarely on the conductor with equal clearance on both sides of conductor.
5. Starting at the span end of the dead end, follow the tightening sequence shown below, tighten all bolts to approximately 5 ft.-lbs. (7 Nm for metric). Repeat to approximately 25 ft.-lbs. (33 Nm for metric). Then final pass until break-away head breaks off. The sequential pattern is set up to equalize the load in each bolt and to prevent the deadend keepers from cocking to one side during installation.



6. If cable guide is not supplied, proceed to step 8. Cable guide, if used, is provided to insure that minimum bending radius of OPGW is not violated. Care should be exercised to avoid undue stress on cable guide. Note: cable guide is not a structural member and adds nothing to the holding strength of the clamp. Train conductor to make it bottom along the cable guide groove. This is important to assure clearance for the link plate/connecting hardware.
7. After placing OPGW into cable guide groove, install cable guide keeper with lockwashers and green break-away bolts alternately tightening bolts by 2 ft.-lbs. Repeat until break-away head breaks off. Care should be taken during installation to maintain the keeper squarely on the conductor with equal clearance on both sides of conductor.
8. Install connecting hardware with dead end clevis bolt. Check for clearance with OPGW.
9. If re-installation is necessary, bolts should be torqued according to the chart below. Installation with a torque wrench must be performed when break-away bolt is not present.

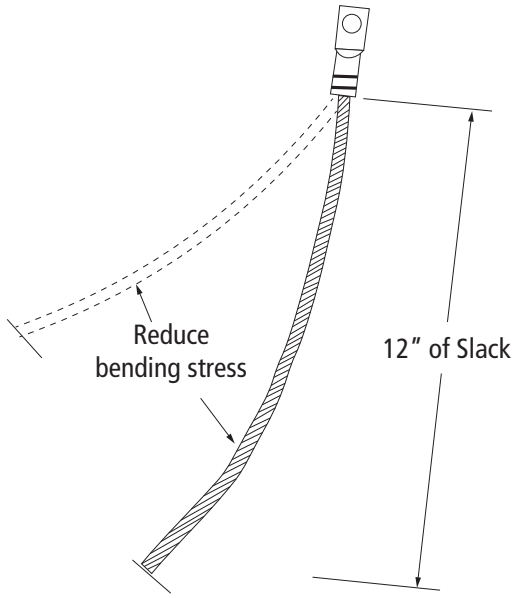
BOLT SIZE (IN.)	BOLT COLOR	BREAK-AWAY TORQUE (FT-LBS.)
1/2	Black	27-32
5/8	Red	35-40
5/8	Blue	40-45



continued

Installation Instructions for OPGW Bolted Dead End

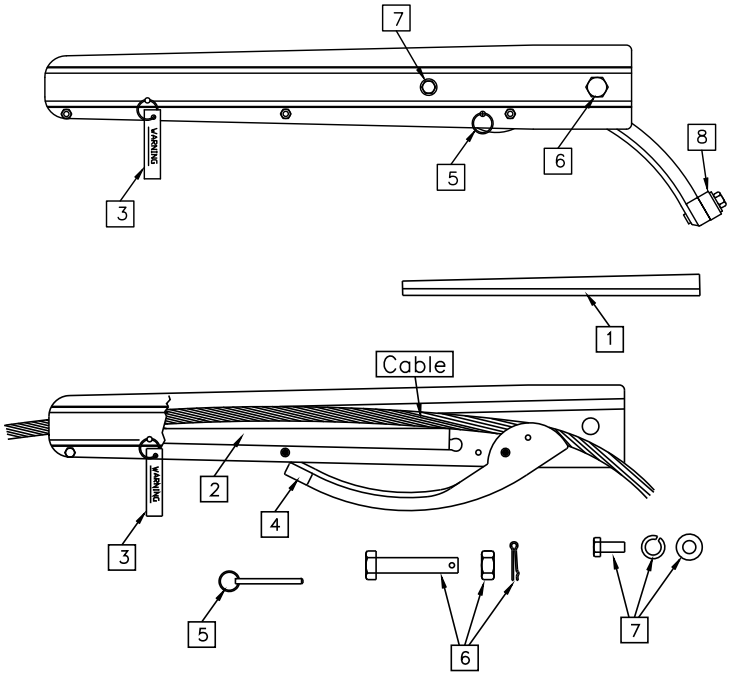
10. Attach grounding lug to grounding pad on side of dead end body (using 1/2″-13) if grounding is required. Ground wire assembly must be long enough such that 12″ of free slack wire extends directly down from the suspension grounding pad before looping back up to the adjacent structure attachment point.



Installation Instructions for OPGW Wedge Dead End

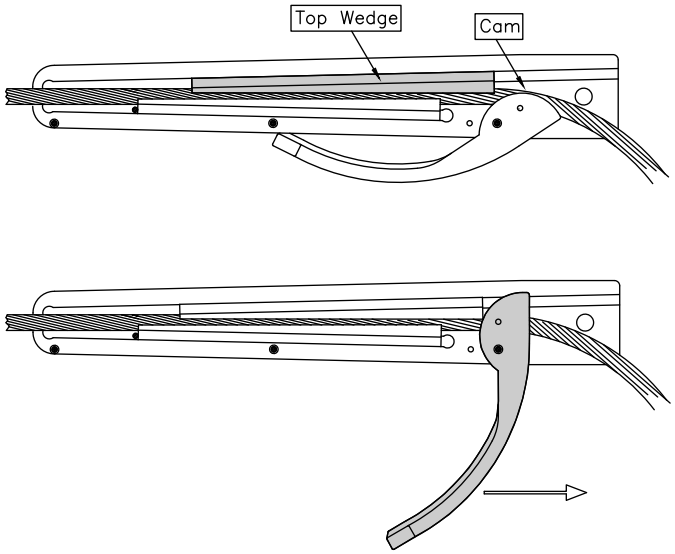
Parts of the Assembly

1. Top Wedge
2. Bottom Wedge
3. Wedge Retaining Pin (with Warning Label)
4. Cam/Cable Guide
5. Cable Guide Retaining Pin
6. Attachment Hardware
7. Grounding Hardware
8. Keeper



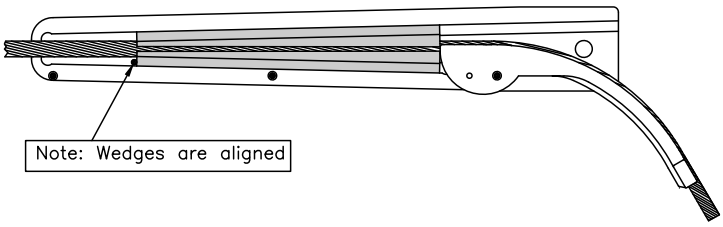
Installation Instructions

1. Hardware items (Items 6 & 7) are removed.
2. Top Wedge (Item 1) is removed.
3. Cable Guide Retaining Pin (Item 5) is removed.
4. Cam/Cable Guide (Item 4) is advanced as shown.
5. Cable is installed through the open top of the assembly and seated in Bottom Wedge.
6. Top wedge is installed and pushed beyond the "Cam" of the Cam/Cable Guide (Item 4).
7. The Cam/Cable Guide is pulled back to advance the top wedge.



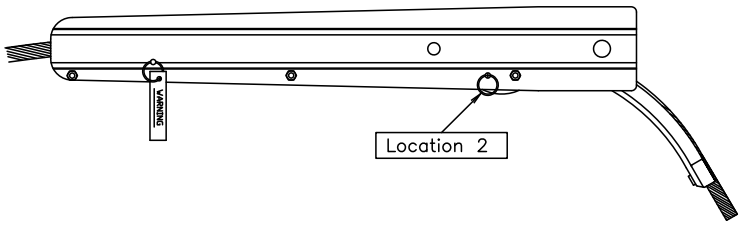
Installation Instructions for OPGW Wedge Dead End (cont.)

8. When Cam/Cable Guide is pulled back to position as shown, the Top Wedge will be inline with the Bottom Wedge.



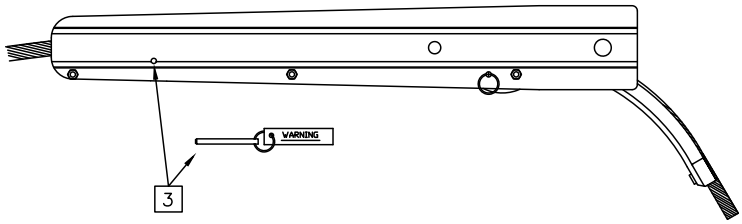
9. Replace Cable Guide Retaining Pin (Item 5) in "Location 2".

NOTE: Retaining Pin is installed through both side plates and holes shown at Location 2.



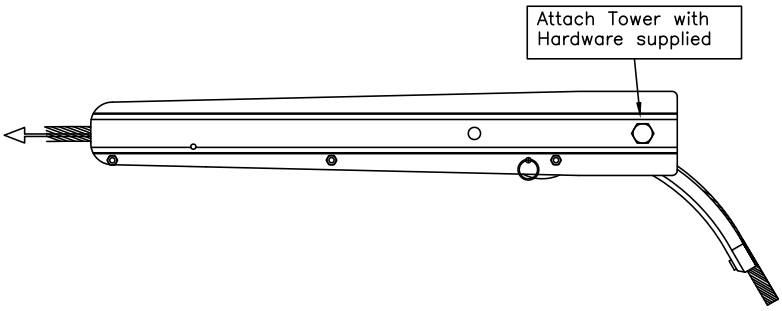
10. Remove Wedge Retaining Pin (Item 3).

NOTE: If Wedge Retaining Pin (Item 3) is not removed the dead end will not hold tension.



11. Attach OPGW Wedge Dead End to the tower with bolt, nut, and cotter pin supplied. Release tension on comealong. The wedges (Items 1 & 2) will advance, gripping the cable securely.

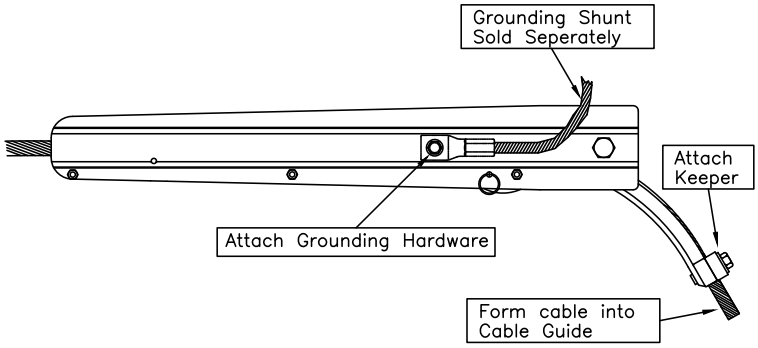
NOTE: A comealong is a temporary device which holds the cable during tensioning. The comealong is attached to a tensioning device, which is then attached to the tower. The comealong is located a distance from the end of the cable, leaving the end of the cable free to attaching the dead end.



12. Form cable into the groove of the Cam/Cable Guide, then attach keeper (Item 8) with lockwashers and green break-away bolts alternately tightening bolts by 2 ft.-lbs. Repeat until break-away head breaks off. Care should be taken during installation to maintain the keeper squarely on the conductor with equal clearance on both sides of conductor.

13. Attach grounding shunt with hardware provided. Torque bolts to 25 lbf.-ft. (34 N.m)

NOTE: Grounding Shunt sold separately. Contact customer service for ordering information.



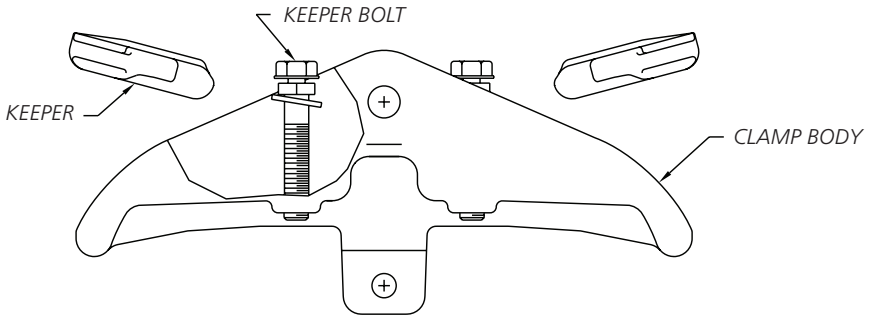
14. Assembly is complete.

Ref L8880

Installation Instructions for OPGW Double Suspension Unit

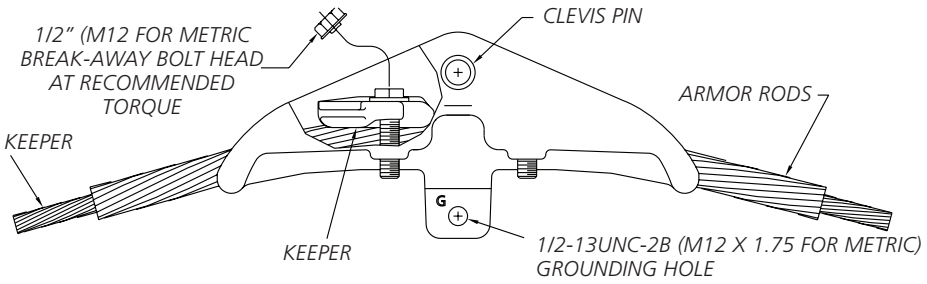
1. Mark center of clamp location on cable with ink (not tape).
2. Install the armor rods on cable aligning center mark of armor rods with center mark on OPGW (per Step 1).
3. Mark centers of clamp locations on armor rods with ink (not tape). This distance is equal to 1/2 the dimension between attachment holes on the yoke plate.
4. Remove clamp clevis pin. Loosen, but do not remove clamp keeper bolts. Remove the clamp keepers (see Figure 1).

FIGURE 1



5. Place clamp body on OPGW and center clamp on one of the center marks (per Step 3).
6. Place keepers in clamp and slide keepers under keeper bolts.
7. Tighten keeper bolts finger tight and insure that keepers are not cocked on OPGW.
8. Tighten keeper bolts on each keeper in 5 ft-lb increments, alternating tightening to insure keepers are not cocked in clamp. Tighten until break-away bolt head shears off (see Figure 2).

FIGURE 2



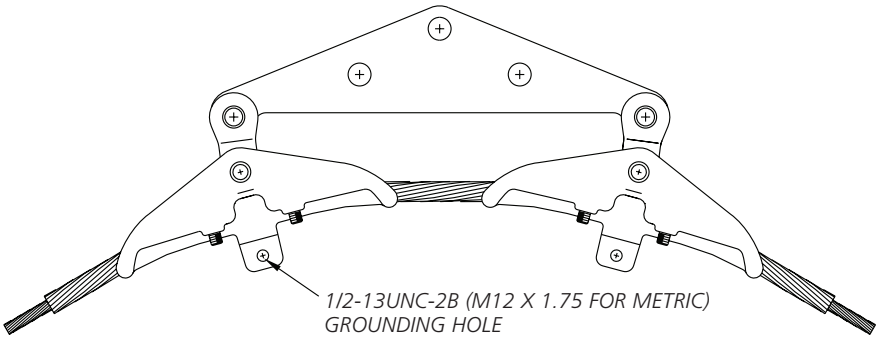
Installation Instructions for OPGW Double Suspension Unit (cont.)

9. Repeat steps 4 through 8 for the other clamp.

10. Attach clevis eye to clamp bodies with clevis pins and install cotter pins in clevis pins.

11. Attach clevis eyes to yoke plate.

FIGURE 3 - COMPLETED ASSEMBLY



12. Attach completeed assembly to tower attachment (see Figure 3).

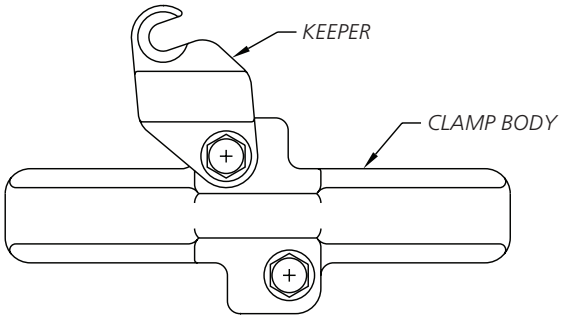
13. Attach grounding lug to grounding pad (side marked "G") on bottom of suspension clamp (using 1/2"-13 thread tapped hole) if grounding is required.

Ref L8881

Installation Instructions for OPGW Trunnion

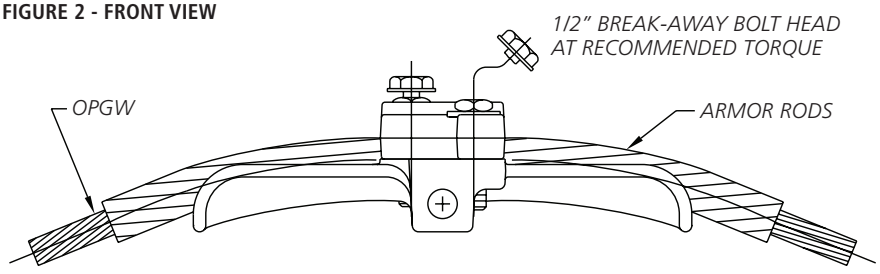
1. Mark center of clamp location on OPGW with ink (not tape).
2. Install armor rods on OPGW aligning center mark of armor rods with center mark on OPGW (per Step 1).
3. Loosen, but do not remove clamp keeper bolts. Rotate clamp keeper 180° from original position (see Figure 1).

FIGURE 1 - TOP VIEW



4. Place OPGW in clamp body and center clamp on armor rod center mark.
5. Return keeper to it's original position.
6. Tighten keeper bolts finger tight and insure that keeper is not cocked on OPGW.
7. Tighten keeper bolts on keeper in 5 ft-lb increments, alternating tightening to insure keepers are not cocked in clamp. Tighten until break-away bolt head shears off (see Figure 2).

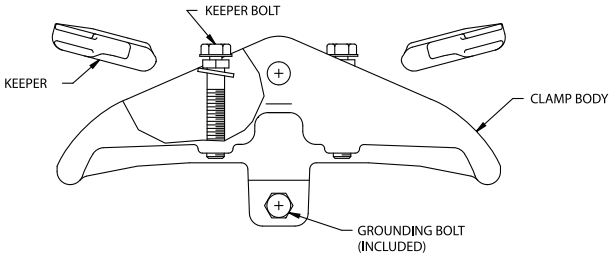
FIGURE 2 - FRONT VIEW



Installation Instructions for OPGW Suspension Unit

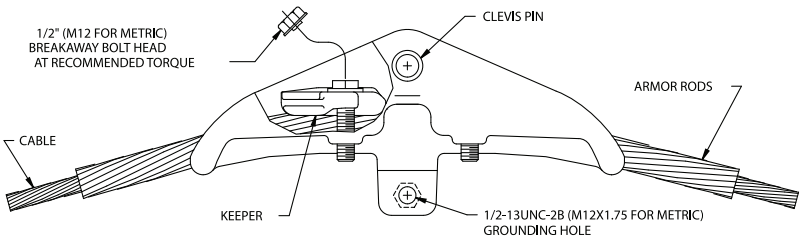
1. Mark center of clamp location on OPGW cable with ink (not tape).
2. Install armor rods on cable alligning center mark of armor rods with center mark on OPGW cable (per **Step 1**).
3. Remove clamp clevis pin. Loosen, but do not remove clamp keeper bolts. Remove clamp keepers. See **Figure 1**.

FIGURE 1:

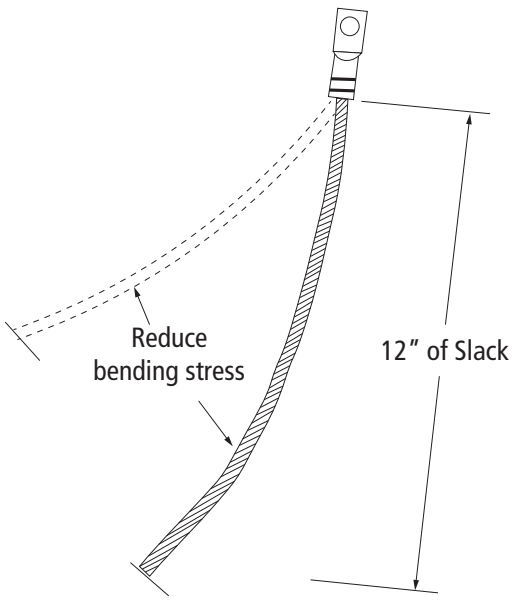


4. Place clamp body on OPGW cable and center clamp on armor rod center mark.
5. Attach clamp to tower attachment with clevis pin and install cotter pin in clevis pin.
6. Place keepers in clamp and slide keepers under keeper bolts (if double sided keeper, diameter range faces cable and armor rods).
7. Tighten keeper bolts finger tight and insure that keepers are not cocked on OPGW cable.
8. Tighten keeper bolts on each keeper in 5 ft-lb (7 nm for metric) increments, alternating tightening to insure keepers are not cocked in clamp. Tighten until break-away bolt head shears off (20-25 ft-lb or 28-35 nm for metric). See **Figure 2**.

FIGURE 2:



9. Attach grounding lug to grounding pad on bottom of suspension clamp (using 1/2″-13 or m12x1.75 Thread tapped hole) if grounding is required. Ground wire assembly must be long enough such that 12″ of free slack wire extends directly down from the suspension grounding pad before looping back up to the adjacent structure attachment point.



Instructions for Preparing

AFL Optical Ground Wire (OPGW)

in the AX Series Connector Kit

Covers AlumaCore, CentraCore, PentaCore,

HexaCore, TriCore & MiniCore Designs of OPGW

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LIST OF MATERIALS

Included in the AX Series Connector Kit

- Connector Kit Body
- Wire Retaining Ring
- Retaining Ring Set Screws
- Bushing
- Retaining Nut
- Filler Sleeve (only for stranded stainless cables)
- Strength Member Eyebolt
- Bolt, Washer, & Nut for Eyebolt

Suggested Tools

- 3/8" Socket Driver
- 5/32" Hex Driver
- Tape Measure
- Cable Cutter
- Pipe Ring Cutter (for aluminum pipe)
- Stainless Steel Pipe Ring Cutter (for stainless steel pipes)

Additional Consumables

- Furcation Kit - AFL Part Number: AXOFK01
- RTV Silicone Sealant - AFL Part Number: 0070050

1.0 Purpose of Installation

The purpose of installing an Optical Ground Wire (OPGW) into a splice box is to connect one OPGW to another and protect the connection in a sealed enclosure. To install OPGW into the Apex series of splice enclosures, use of the AX Series Connector Kit is required.

2.0 Scope

This document describes and illustrates the installation of Optical Ground Wire into the AX Series Connector Kit. This connector kit has the following advantages:

1. Utilization of the same core hardware design which allows for use with AlumaCore, CentraCore, MiniCore, TriCore, HexaCore and PentaCore designs of OPGW with minor hardware changes.
2. The ability to be used inside of the Apex X-2 and Apex X-2S sealed splice closures without modification of the body design because they utilize the same base design.
3. Ability to use standard Apex hardware without the need for specialized tools.

3.0 Precautions

3.1 Health

Optical fibers are very thin, fragile, and sharp. Therefore, careful handling is required to avoid either damage to the delicate glass fibers or, more importantly, injury to the technician or bystander. Small fiber scraps should be deposited on strips of adhesive tape, placed in a bottle or vinyl bag, properly disposed. Do not eat or drink when working with optical fibers as small pieces of glass may inadvertently be ingested. Never look directly at the end of a fiber unless you are certain that no laser light is being transmitted through the fiber.

3.2 Work Environment

Handle optical fiber and fiber cable carefully, taking care to impose no damage by physical shock or sharp bends. During the actual splicing, care must be taken to keep hands and work area clean in order that the fibers may be kept clean. Dirty fibers mean poor splices! Keep all tools and equipment in their proper cases or storage pouches when not in use. Consideration should be given to the work area in which the splice box will be organized. A clean, snag-free horizontal surface (protected from wind) is necessary.

4.0 Precautions

Prepare the connector body for installation into the Apex unit, by installing the cable attachment unit (CAU) onto the connector kit body. The connector kit body is the large aluminum section that makes up much of the assembly. Remove any of the additional items (retaining ring, bushing, retaining nut, & filler sleeve) from the connector kit body. The Cable Attachment Unit (***Figure 1***) should be used with all installations. For all OPGW cables the bottom of the CAU should be detached so that the CAU looks like ***Figure 2***.

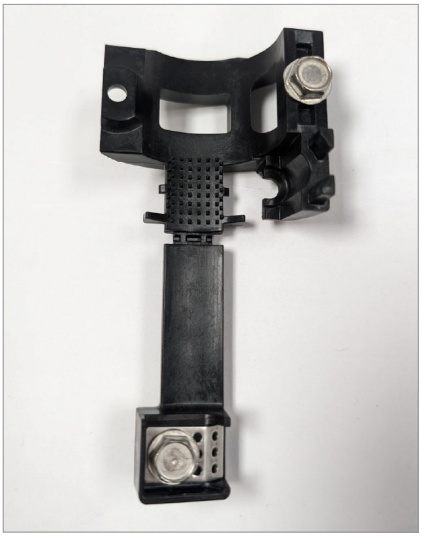


Figure 1

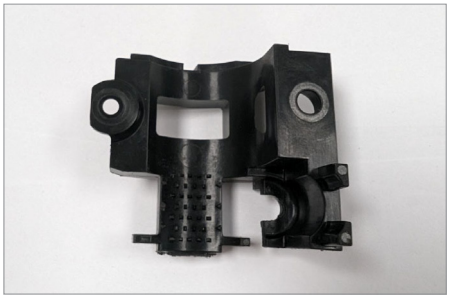


Figure 2

Start by unscrewing the hose clamp completely so that it can be opened into a “U” Shape. Then place the connector kit body Into the CAU and tighten down the hose clamp to 40 in-lbs. The hose clamp should be positioned on the knurled section of the connector kit body about 7/16" from the triangular flange on the connector kit body. The set screws should be facing upwards. The result should look like ***Figure 3***.

Figure 3

5.0 Cable Preparation

5.1 Initial Preparation

Slack cable lengths should be identified based on the cable and coil bracket used. For installation into the AX Series Connector Kit, a section of cable 10 feet in length should be utilized. This provides enough length to route the cable through the connector kit and the fiber trays.

1. Mark the cable 10 feet from the ends of the fibers to be spliced. The cable should be through cut on the right end of the cable.
2. Slide the retaining ring onto the cable past the 10 ft marking (***Figure 4***).
3. Unlay the outer wire layers and cut them at the 10 ft marking. Unlaying the wires past the 10 ft marking allows the wires to be cut without bending them. Extra care should be taken with stranded stainless cable designs to avoid cutting, nicking, or prying against the stainless tubes when unlaying and cutting the outer strands. Ensure that all the wires are cut evenly as offset wires can leave a gap for moisture.

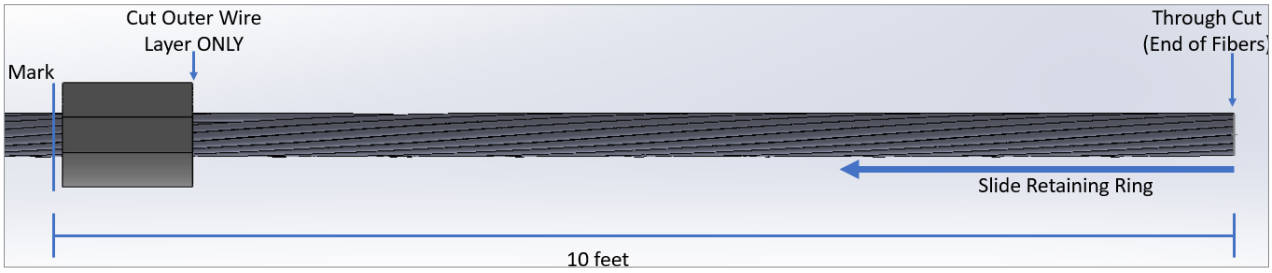


Figure 4

4. Return the outer strands to their original lay around the inner layer. Slide the retaining ring back down the cable flush with the cut strands (***Figure 5***).

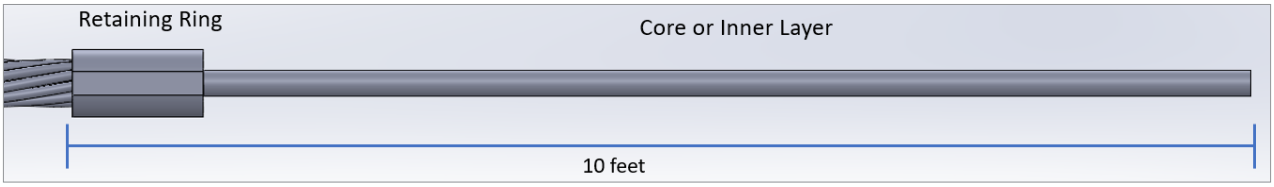


Figure 5

Different types of OPGW cores have different instructions for completing preparation into the AX series Connector Kit. Each type will be discussed below.

5.2 Preparation for AlumaCore and CentraCore

For AlumaCore and CentraCore designs, measure from the retaining ring up to 6.75" and use a pipe ring cutter to gently score the aluminum pipe at this location. At this point the installer should add a ring of RTV around the cable wire ends (***Figure 6***).

Figure 6

Thread a section of pipe through the connector kit for easier retrieval of the fibers, then gently bend the pipe back and forth no more than 10 degrees at a time to break the pipe free (***Figure 7***).

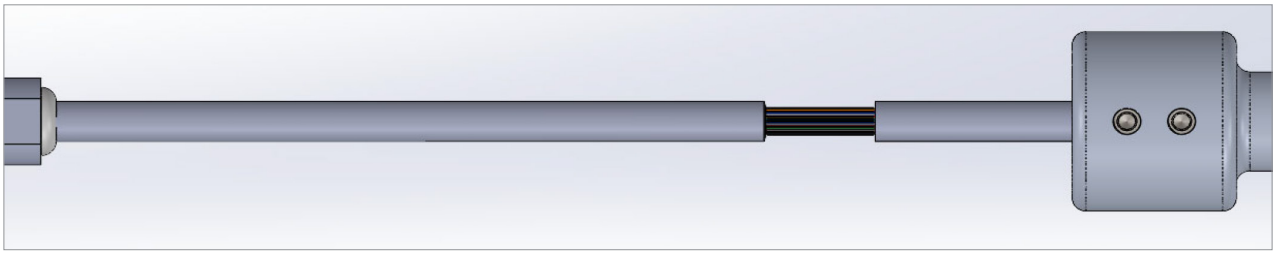


Figure 7

Remove the pipe from the fiber. This may be done in sections to make removal easier and protect the fibers. Take great care not to damage the fibers during this process.

For CentraCore designs, care should be taken to not kink of damage the inner stainless steel tube when removing the aluminum pipe. After the aluminum pipe is removed, follow the instructions in Section 5.3 for the handling and removal of the central stainless steel tube.

Apply a bead of RTV inside the connector kit near the base (***Figure 8***).

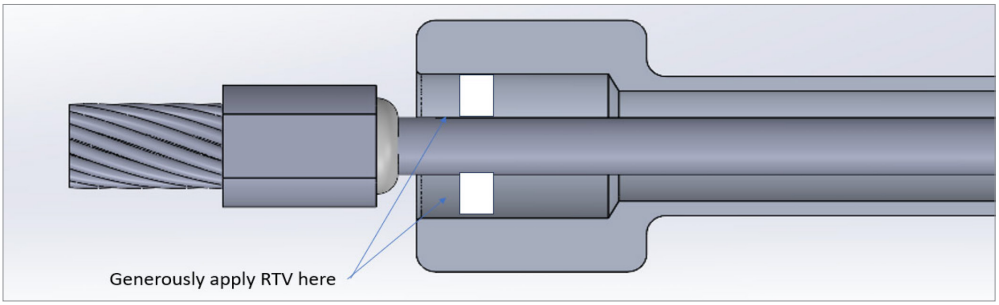


Figure 8

Seat the retaining ring in the connector kit (***Figure 9***). The flat side of the retaining ring should face the set screw holes.

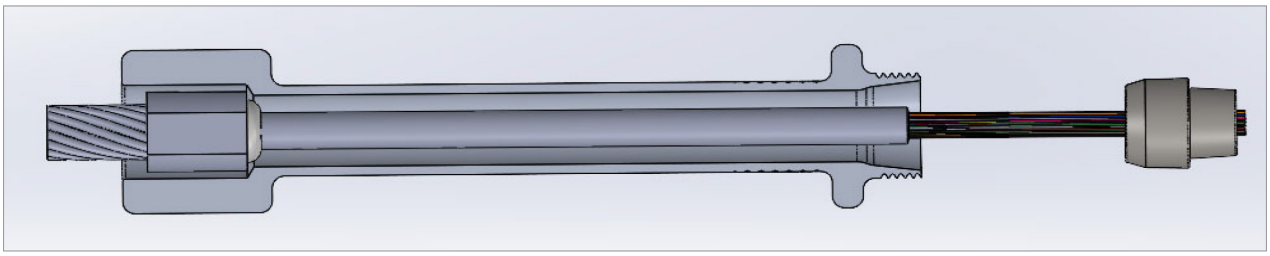


Figure 9

Install the set screws to a torque value of 100 in-lb. Apply RTV around the inside of the connector kit by the pipe opening. Apply RTV around the grommet and then seat the grommet on the pipe. Finally, apply RTV to the outside opening (***Figure 10***).

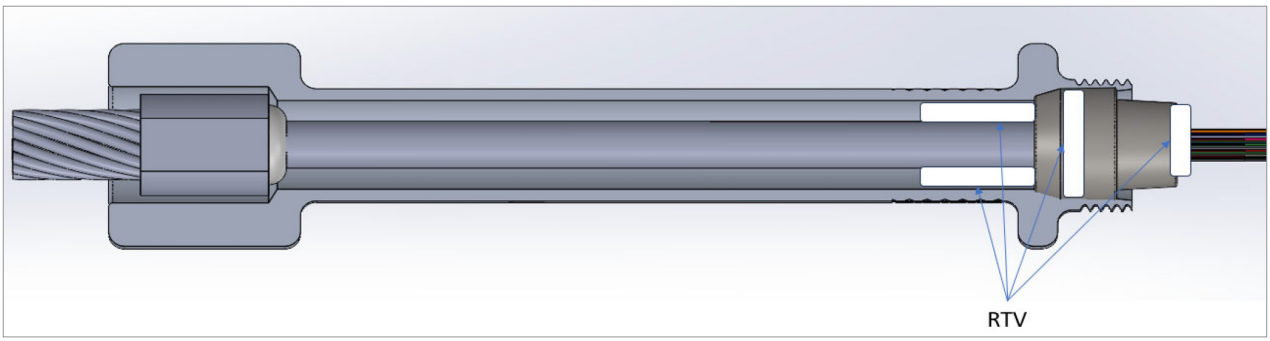


Figure 10

Thread the retaining nut over the fibers and install it on the connector kit body, ensuring it seats and compresses the grommet (***Figure 11***).

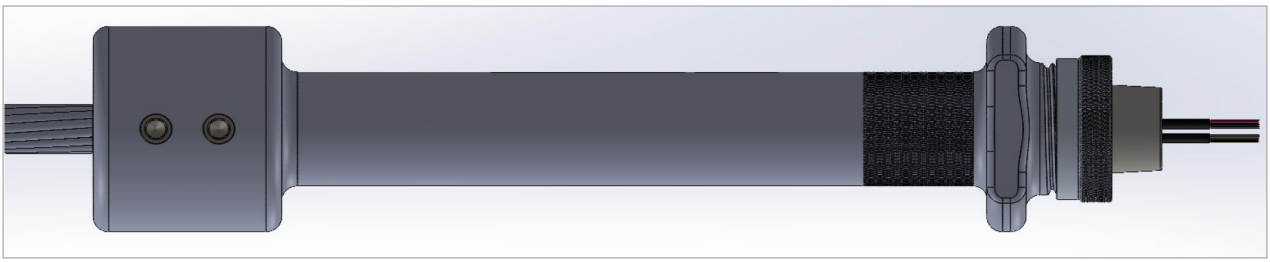


Figure 11

5.3 Preparation for Stainless Steel Designs

For HexaCore, PentaCore, and MiniCore designs, after the outer wire strands are removed, the inner wires should be marked and cut 5.75" from the retaining ring. Remove the cut inner wires so that the cable looks like the figure below (***Figure 12***).

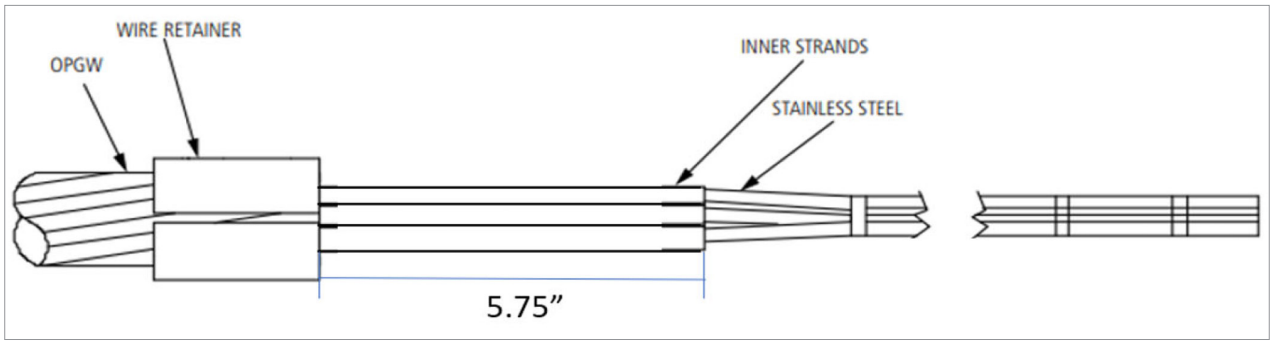


Figure 12

Run a two-inch piece of heat shrink down to each stainless-steel tube at this point. The heat shrink inner diameter is much larger than the stainless-steel tube outer diameter so this should be a relatively quick process.

Add a ring of RTV around the cable wire ends (***Figure 13***). Thread the stranded stainless-steel tubes first through the filler sleeve and then the connector kit body for easier retrieval of the fibers (***Figure 13***), then mark the stainless-steel tube(s) 8" to 10" from the end of the retaining ring. From the marked location, make addition markings in 4-foot increments until the free end of the cable is reached. One tube at a time, carefully score the marking closest to the free end using a stainless-steel pipe ring cutter. Flex the tube at the scored location to break and separate the tube. Continue to score and remove each 4-foot section of tube until you all the tubing is removed up to the 8"-10" marking as shown in ***Figure 13***. Special care should be taken to ensure that the fibers do not scrape against the ends of the tubes during the removal.

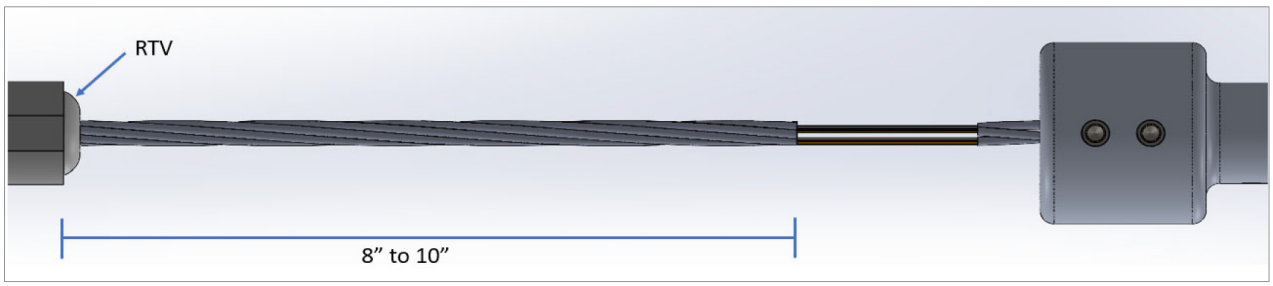


Figure 13

Slide the heat shrink tubing so that it covers one inch of the fibers and one inch of the stainless-steel tubes as shown (***Figure 14***). Using a heat gun on a low setting, shrink the tubing around the stainless-steel tube and fibers. Ensure that the heat is applied evenly to the heat shrink tubing so that the result is straight and even. The heat shrink tube will not shrink completely onto the fibers. Particular care should be taken to ensure that the hot air blast does not remain on the optical fibers for an extended period. Never use a torch to shrink the tubing. Allow the tubing to cool for approximately 10 minutes.

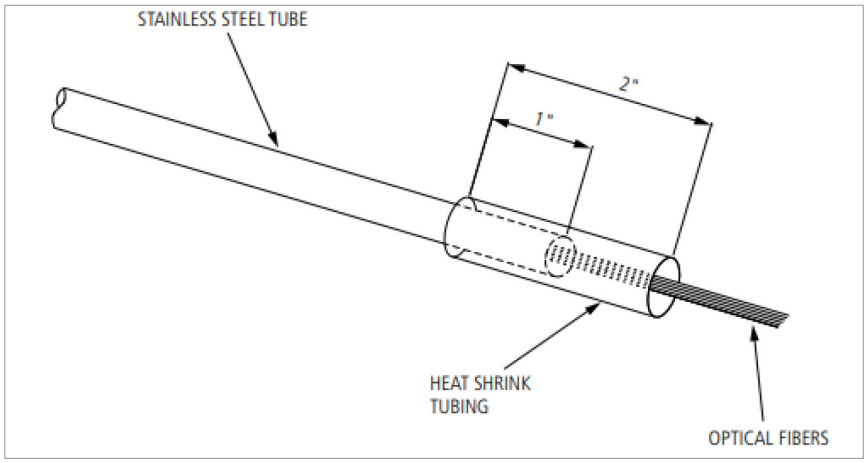


Figure 14

Slide the filler sleeve over the fibers until it butts up against the retaining ring. Situate the filler sleeve as shown, then fill the sleeve generously with RTV using the 2 ports in the filler sleeve (***Figure 15***) by filling the sleeve as it sits, then rotating the sleeve 180 degrees and filling the other side. It is alright if some RTV leaks out of the filler sleeve as this will show that it has been filled correctly. Apply electrical tape on the filler sleeve at the indicated locations in ***Figure 15*** to increase friction and keep the filler sleeve aligned as the connector kit body is added.

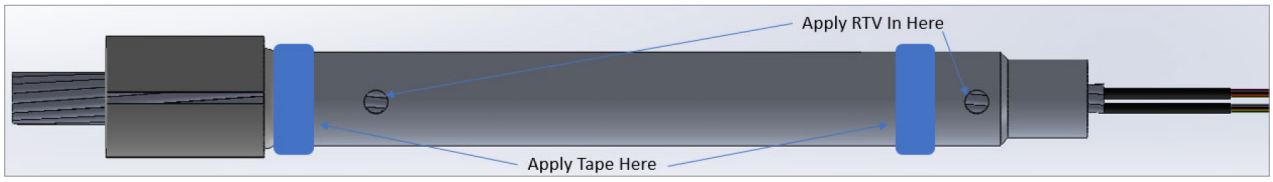


Figure 15

Place a layer of RTV inside the connector kit at the base (***Figure 16***).

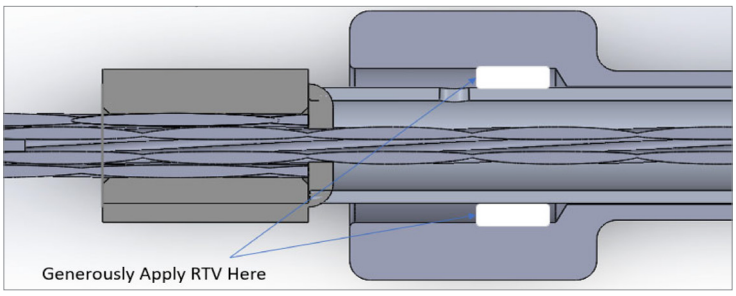


Figure 16

Seat the retaining ring in the connector kit (***Figure 17***), and install the set screws to a torque value of 100 in-lbs.

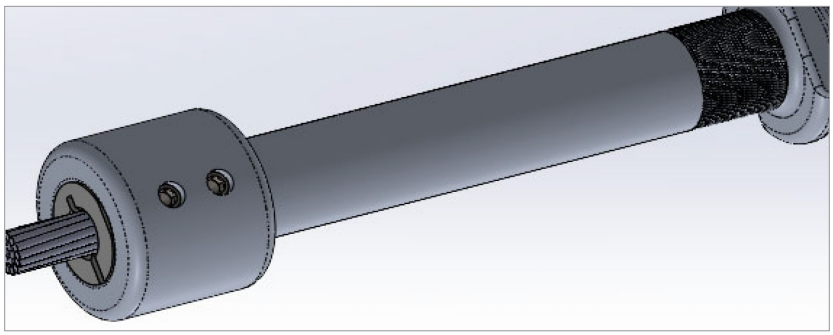


Figure 17

Apply RTV to the inside edge of the grommet and seat the grommet on the filler sleeve edge. Then apply RTV to the outside opening (***Figure 18***).

Figure 18

Thread the retaining nut over the fibers and install it on the connector kit, ensuring it seats and compresses the grommet (***Figure 19***). The connector kit is now installed properly. Furcation tubing must be applied prior to installing and routing the fibers into the Apex closure.

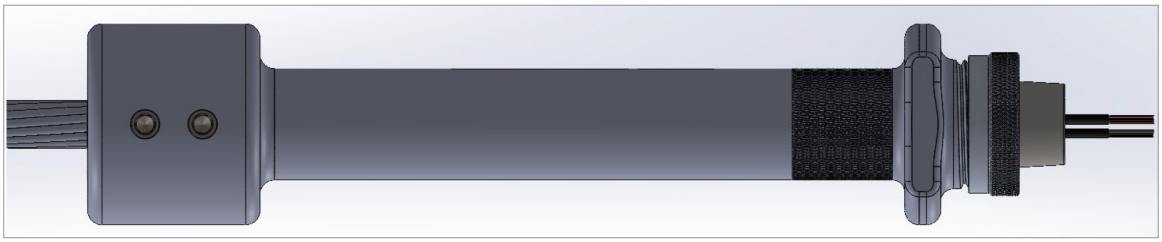


Figure 19

6.0 Connector Body Installation

Now that the cable is installed in the connector kit, the cable can be installed into the Apex unit. Remove locking ring from the Apex to allow the base of the Apex to be removed from the housing. Remove the sealing wedge from one of the cable entry locations. It is recommended to start with the cable entry location marked with a 1 and proceed with the next available number for each subsequent cable, as this will allow for the easiest cable routing into the splice trays. Place the connector kit body inside the Apex base so that the CAU can be bolted into the base. Each installation should look like ***Figure 20***. After all needed connector kit bodies are installed, install the Apex gel wedges (***Figure 21***) per Apex installation instructions.

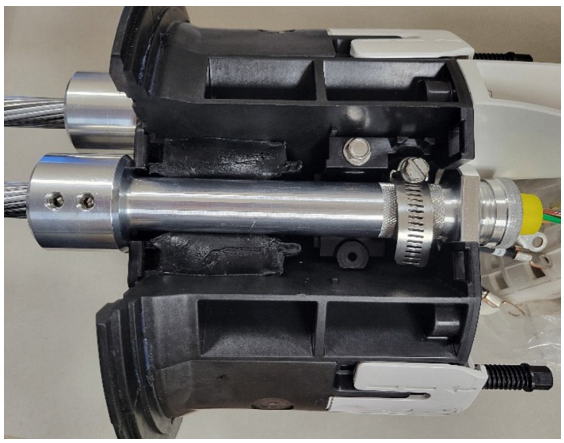


Figure 20

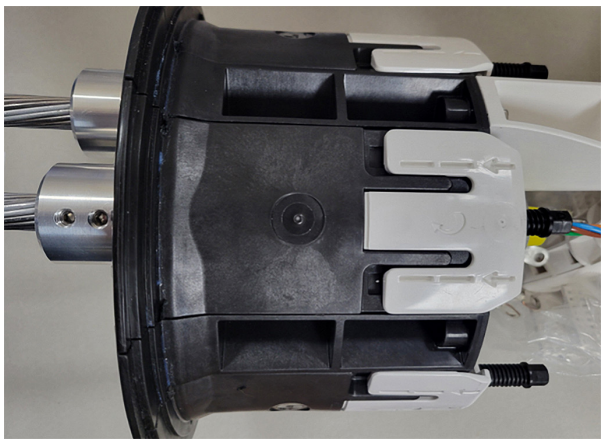


Figure 21

If two cables are installed the base of the connector kit should look like ***Figure 22*** with the cables in positions 1 and 2 adjacent to each other.

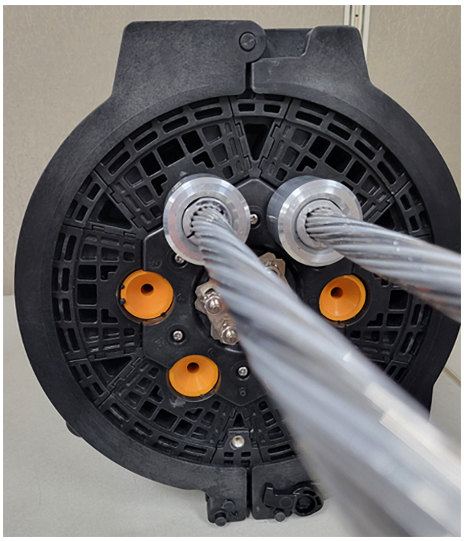


Figure 22

For AlumaCore designs with an aramid strength member the eyebolt supplied with the connector kit assembly is used. The aramid should be tied to the eyebolt to prevent the fibers from retracting into the cable. Cut off any excess aramid after tying it to the eyebolt. As shown in ***Figure 23***. For AlumaCore designs with a Fiberglass Reinforced Plastic (FRP) strength member the bolt, nut, and washer combo supplied with the eyebolt is used. Push the FRP through the eyebolt and tighten the nut to clamp the FRP to the eyebolt. Apply RTV to the top of the grommet if a strength member is used.

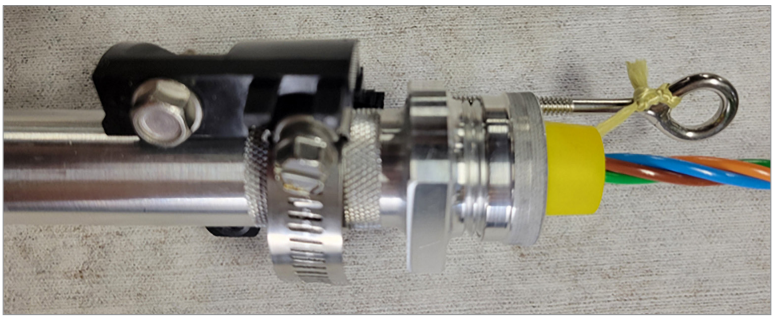


Figure 23

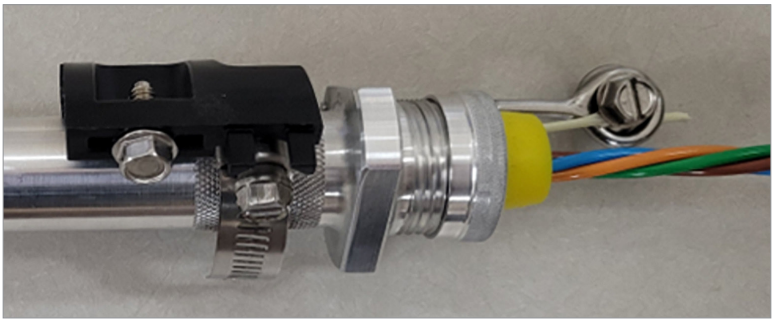


Figure 24

Finally, place one last bead of RTV over the outside of the retaining sleeve (***Figure 25***).

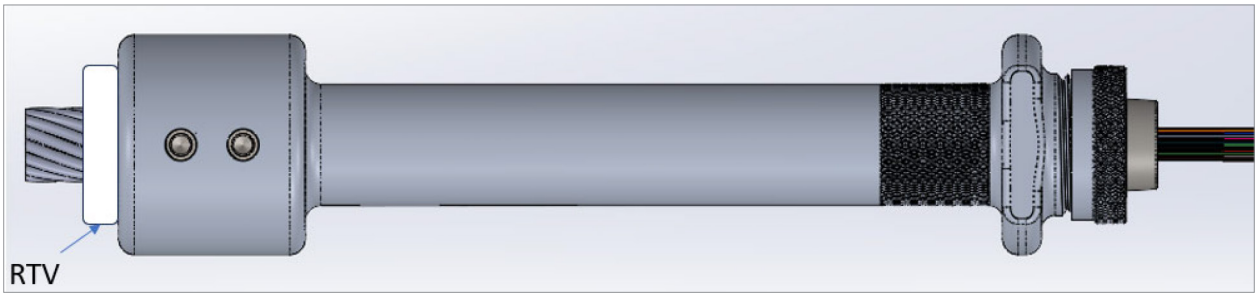


Figure 25

The connector kit is now installed properly, and the fibers may be routed according to Apex specifications.

7.0 Torsional Resistance

If torsional forces are expected to be placed on the cables, then an FDOA downlead clamp should be installed to tie two cables together and prevent damage from torsional forces. If more than two cables are installed in the Apex enclosure, then additional FDOA clamps can be used to secure the additional cables. The FDOA clamps should be placed approximately two feet from the bottom of the Apex enclosure (***Figure 26***). Please follow the FDOA specific installation instructions when installing.

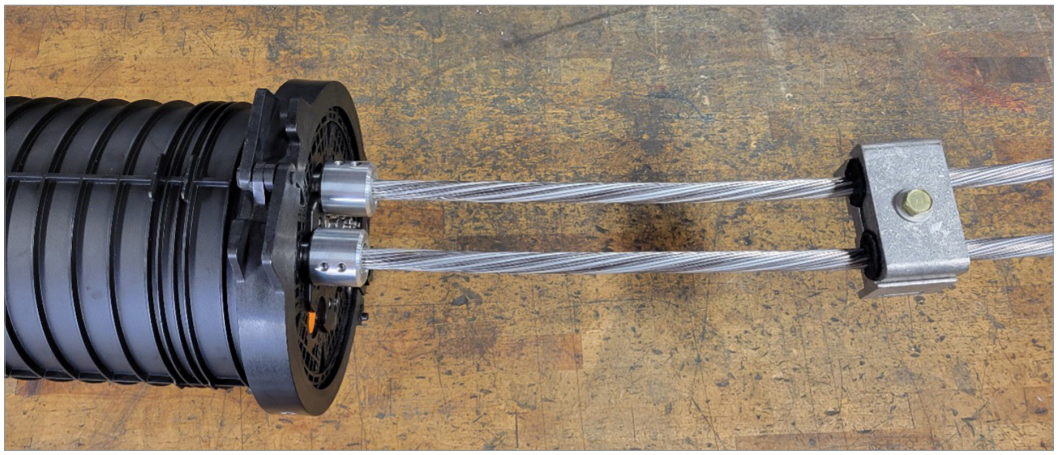
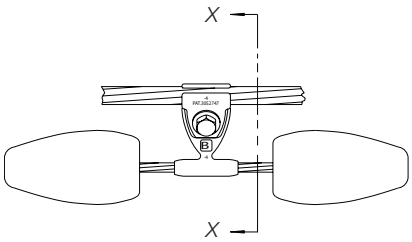


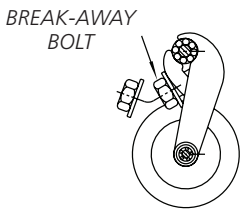
Figure 26

Ref L8882

Installation Instructions for OPGW Vibration Damper

CABLE DIAMETER	BOLT SIZE	BREAK-AWAY TORQUE ft. lbs. (Nm)	
		MIN.	MAX.
.360 - .770	7/16 (M12)	18 (24)	23 (31)
.771 - .970	1/2 (M4)	20 (41)	25 (47)





General information and spacing recommendations:

AFL vibration dampers are produced with carefully designed and controlled dimensions. The dampers should be protected, preferably in their shipping containers, from dirt and foreign material prior to installation. Handling in the field should be with care to avoid mechanical damage.

AFL vibration dampers may be installed without disassembly of the clamp parts.

Obtain the required damper spacing from AFL.

Mechanical Suspension (See page 15)

"One end" applications require a damper installed a distance "B" from the center of the suspension clamp at one end of the span. "Both ends" applications require a damper installed a distance "B" from the center of the suspension clamp at each end of the span.

Armor Grip Type Suspension

"One end" applications require two dampers installed at one end of the span. Install the first damper at the end of the rods and the second damper a distance "D" from the first damper. "Both ends" applications require two dampers installed at each end of the span with the first damper installed at the end of the rods and the second damper installed at the specified "D" spacing.

AFL Bolted Deadend (See page 3)

"One end" applications require two dampers at one end of the span with the first damper spaced a distance "D" from the end or mouth of the deadend and the second damper spaced a distance "D" from the first damper attachment point. "Both ends" applications require two dampers at each end of the span with the first damper spaced a distance "D" from the end or mouth of the deadend and the second damper spaced "D" distance from the first damper attachment point.

Formed Wire Deadend (See page 46)

"One end" applications require two dampers at one end of the span with the first damper placed at the end of the armor rods and the second damper spaced a distance "D" from the first damper attachment point. "Both ends" applications require two dampers at each end of the span with the first damper placed at the end of the armor rods and the second damper spaced a distance "D" from the first damper attachment point.

NOTE: For those spans with a deadend at one end and a suspension unit at the other, a damper application required at one end should be applied to the suspension side of the span. Depending on the type of suspension unit, refer to the appropriate damper placement instructions listed previously.

1. Loosen the bolt so that the clamp may be opened sufficiently to permit cable entry into the clamp groove.

NOTE: The bolt need not be removed.

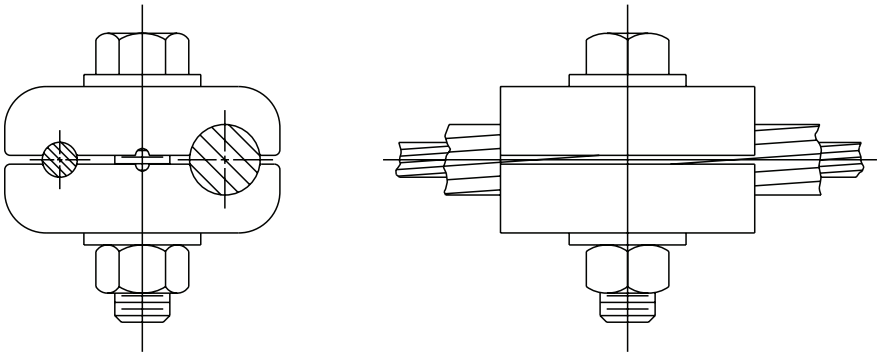
2. Hang the damper on the OPGW at the proper spacing specified and tighten the bolt finger tight.

3. Tighten the bolt with a suitable wrench until the break-away head shears off.

NOTE: The table to the right provides the typical clamp, bolt diameters, and break-away torque range for the OPGW dampers.

Ref L8883

Installation Instructions for OPGW Ground Clamp



1. Clean both run and tap conductors over the length to be clamped with a wire brush to remove oxides.

2. Place connector halves on the conductor, being careful to place the recommended run and tap conductor in the proper clamp groove and to distribute the alnox evenly over the conductor.

3. Bolt bonding P.G. clamp on conductors. Use a backup wrench to restrain the head of the bolt while tightening hardware to avoid bending the fiber optic composite cables. Tighten bolts to the recommended installation torque.
   (1/2" Bolt: 20-25 lbf-ft, M14 bolt: 27-34 Nm)

4. Do not remove alnox that squeezes out when clamp is tightened.

CAUTION: In order to avoid damage to the fiber optic composite cables, it is essential that they be clamped only in the recommended grooves and that the bolts be tightened only to the recommended installation torque.

Installation Instructions for OCA Series Comealongs for Optical Ground Wire (OPGW)

General

OPGW Comealongs are stringing tools designed for pulling optical ground wire up to initial sag tensions. If the required tension is greater than the rated tension of a single comealong, two or more comealongs should be used (refer to Installation Instructions). When desired sag tension is reached, the cable should be dead ended promptly and the comealong removed.

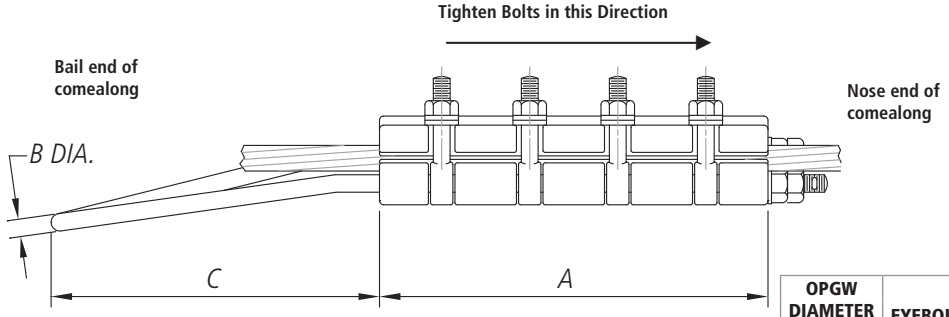
Comealongs must receive periodic maintenance. This practice should consist of a thorough cleaning with close inspection for nicked or rough cable grooves, cracked body, bent eye bolts, or damaged bail. The eyebolts should be kept clean and oiled. The cable groove should be kept clean and dry. After each six months use and at the beginning of each job, all comealongs should be subjected to a pull test equal to its rated strength. If any damage is found, the comealong should be disposed of properly.

Unused Comealongs

1. Loosen bolts so that the comealong may be opened sufficiently. Check for cleanliness of bore and permit conductor entry into the conductor groove.
2. Position the comealong a minimum of 10 feet from the dead end or joint being installed. This will assist in reducing the potential for birdcaging of the conductor during compression.
3. Place the conductor into the conductor groove of the comealong, then close the comealong and finger tighten the bolts.
4. Using a torque wrench, tighten bolts in sequence from bail end to nose of the comealong (see diagram below). It will take a minimum of 6 passes to achieve the correct torque on each bolt. On the first pass, tighten the bolts to 80% of the target torque (1/2" bolt - 32 lb ft, 5/8" bolt - 48 lb ft). On each subsequent pass, tighten the bolts to the target torque (1/2" bolt - 40 lb ft, 5/8" bolt - 60 lb ft), ensuring proper clamping force is achieved.

Used Comealongs

1. Before each job, thoroughly clean the comelaong and closely inspect for nicked or rough conductor grooves, cracked body, bent eye bolts, or damaged bail. If any damage is found, the comealong should be disposed of properly.
2. After cleaning, each comealong should be subjected to a pull test equal to the rated strength stamped on the comealong.
3. Follow sequence 1 through 4 for Unused Comealongs above.



OPGW DIAMETER RANGE (IN.)	EYEBOLTS		DIMENSIONS						WEIGHT	
			A		B		C			
	DIA.	NO.	IN.	MM	IN.	MM	IN.	MM	LB.	KG
0 -.820	1/2"	4	11	279	.5	13	8	203	9	4.08
.821-1.000	5/8"	4	12.5	318	.62	16	8	203	16	7.26

LOAD RATING: **Maximum tension limit is 50% of the rated strength of the OPGW or 5,000 pounds, whichever value is smaller.**

WARNING: **Comealongs are not intended for use as dead ends and are not recommended to hold conductors at sag tension limits for longer than 6 hours.**

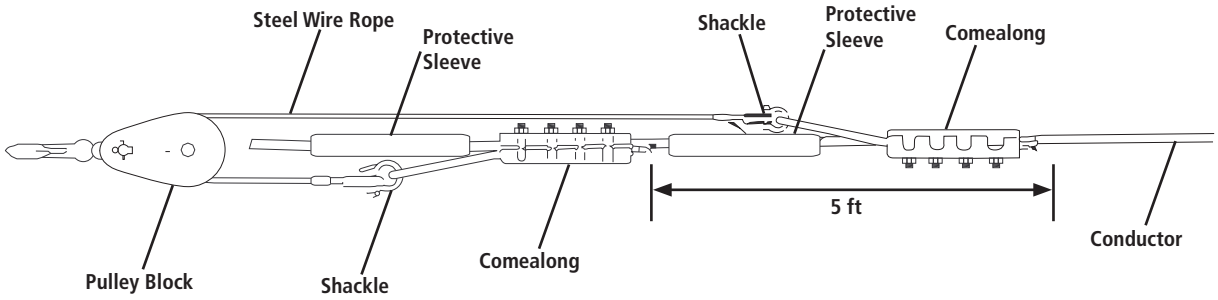
Installation Instructions for OCA Series Comealongs for Optical Ground Wire (OPGW)

Using Comealongs in Tandem

If the installation tension is greater than the rated strength of one comealong, then comealongs must be used in tandem. The comealong bails should be bridled with a sling (consisting of shackles and wire rope) and pulley block to insure equal distribution of the load. To prevent damage to the conductor by the shackles, place protective sleeves over the conductor (per drawing below).

The rated strength of this tandem configuration is 150% of the lowest rated comealong. For example, if one comelaong is rated for 8,000 lbs and the other rated for 10,000 lbs, then these two comealongs in tandem will have a rated strength of 12,000 lbs (150% of 8,000 lbs).

For more information on using comealongs in tandem, contact the ACA Technical Support Team at 1.800.866.7385.



LOAD RATING: Maximum tension limit is 50% of the rated strength of the OPGW or 5,000 pounds, whichever value is smaller.

WARNING: Comealongs are not intended for use as dead ends and are not recommended to hold conductors at sag tension limits for longer than 6 hours.

Request for Vibration Information

Submit via email to:
spbacatechnical@AFLglobal.com

Submit via fax to:
864-433-5434

Originator _____ Date _____

Utility _____ Tel/Fax _____

Project Name _____

For each ruling or deadend span, provide the following information:

1. OPGW Designation _____

2. Average Annual Minimum Temperature (AAMT) for Line (see www.vibrec.com) _____

3. Average Annual Temperature (AAT) for Line (usually 60°F) _____

4. Terrain or Wind Speed:
- ☐ Normal: 15 MPH
- ☐ Flat: 20 MPH
- ☐ Water Crossing: 25 MPH

River/Water Crossing:
- ☐ Yes
- ☐ No

Marker balls used:
- ☐ Yes
- ☐ No

5. Loading Zone:

CHECK ONE	ZONE	ICE (in)	WIND (#/ft²)	K (#/ft²)	TEMPERATURE (°F)
☐	NESC Heavy	0.50	4.00	0.30	0
☐	NESC Medium	0.25	4.00	0.20	15
☐	NESC Light	0.00	9.00	0.05	30
☐	Calif. Heavy	0.50	6.00	0.00	0
☐	Calif. Light	0.00	8.00	0.00	25
☐	Other				

6. Guards:

☐ No Guards (None) ☐ Line Guards (LG) ☐ Armor Rods (AR) ☐ Suspension (AGS) Guard length _____

(if not standard in inches)

7. Spans*:

RULING SPAN (ft)	SINGLE SPAN?	MAX SPAN (ft)	INITIAL TENSION @ AAMT BARE (lbs)	FINAL TENSION @ AAT (lbs)	SPAN LIST (optional) *EXAMPLE: 700, 750, 450, 950, ...*
	☐ Yes ☐ No				
	☐ Yes ☐ No				
	☐ Yes ☐ No				
	☐ Yes ☐ No				
	☐ Yes ☐ No				
	☐ Yes ☐ No				

*If more spans are needed please attach a spreadsheet with the above information to get damper quantities with the recommendation.