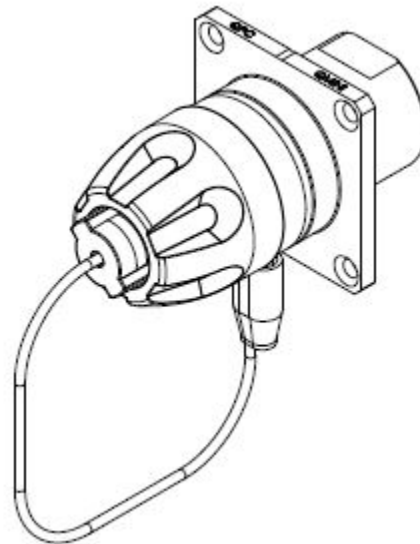
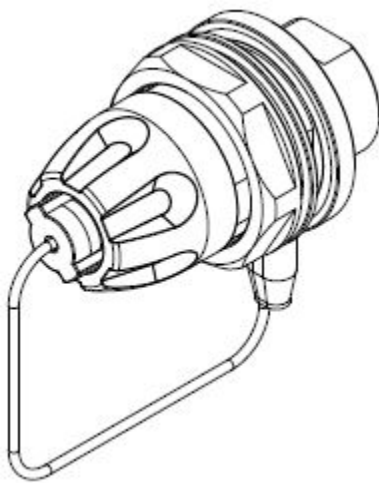


QMini Receptacle Connector Flange Mount and Jam Nut Customer Assembly Instructions



DOCUMENT:
REVISION:
REVISION DATE:

CAI-QMINR-01
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8/13/2019

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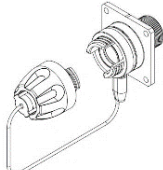
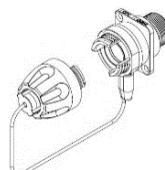


SCOPE








This document will describe the Assembly Instructions for the QPC QMini Receptacle Connector for the Flange Mount and Jam Nut for all cable options.

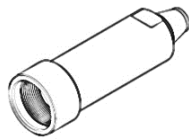




COMPONENTS



 INSERT 2 or 4 Channel	 TERMINI & SPRINGS Qty 2 or 4	 TERMINI RETAINER PLATE & SOCKET HEAD SCREW	 WAVE SPRING
---	--	--	--

CONNECTOR CONFIGURATIONS

FLANGE MOUNT OPTIONS		JAM NUT OPTION	OPTIONAL
			
FLANGE ADAPTER w/ BODY & DUST COVER	FLANGE RX ADAPTER w/ BODY & DUST COVER	JAM NUT ADAPTER w/ BODY & DUST COVER	ALL METAL DUST COVER

BACK NUT ONLY ASSEMBLIES (900µm or 2mm)			LOW PROFILE BACKSHELL ASSEMBLIES (4x2mm or 4.5 – 7.5mm)			
		 CRIMP SLEEVE (2mm Cable Option)	 LOW PROFILE BACK NUT	 STRAIN RELIEF 3x SET SCREWS	 CRIMP & CRIMP SUPPORT (4.5mm – 7.5mm Cable Option)	 4-CHANNEL CRIMP SUPPORT (4x2mm Cable Option)

BACKSHELL ASSEMBLIES (4.5mm – 7.5mm)				
 BACKSHELL	 STRAIN RELIEF & 3x SET SCREWS	 CRIMP & CRIMP SUPPORT	 BEND LIMITER	 WASHER / CABLE SEAL

BACKSHELL ASSEMBLIES (7.6mm – 10.5mm)	
 BACKSHELL	 HEAT SHRINK BEND LIMITER

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TOOL LIST

TK-060 QPC Cable and Connector Prep Tool Kit – (Equivalent tools may be used)	
PT-062	Miller Kevlar Scissors (Carbon Molybdenum & Vanadium Steel Blade)
PT-500	Precise-Control .050" Screwdriver (1.27mm) Hex
PT-501	Precise-Control Screwdriver, 1/16" Hex
PT-503	Precise-Control Screwdriver, 5/64" (2mm) Hex
PT-502	Precise-Control Screwdriver, 3/32" Hex
PT-504	Precise-Control Screwdriver, 2.5mm Hex
PT-505	Screwdriver, Number 1 Phillips, 6-3/4" Overall Length
PT-506	Dial Torque-Measuring Wrench, 3/8" Square Drive, 0 to 150in.-lbs. and 0 to 18NM Torque
PT-536	Crow's Foot Wrench Adjustable 3/8" Square Drive 0.0-1.125"(0-28.57mm)
PT-545	Crow's Foot Wrench Adjustable 1/2" Square Drive .236-1.771" (6-45mm)
PT-546	3/8" Female x 1/2" Male Square Drive Adapter, Chrome
PT-532	Long-Nose Pliers with Flat Jaws, Cushion Grip, 6-3/4" Overall, Manual Jaws with Wire Cutter
PT-599	Hex Bit Set, 5 pcs (.050", 1/16", 5/64", 3/32", 2.5mm) 1/4" Shank, Overall Length 2"
PT-590	Torque-Measuring Screwdriver, Hex Drive, 2.5 to 11.5 in.-lbs. Adjustable Torque
PT-591	4" Drill Press Vise with 2 x Machined Plastic Jaws with Groove

TK-046 QPC QMini Tool Kit – (Equivalent tools may be used)	
PT-392	QMini Torque Fixture (<i>Plug Only</i>)
PT-540	Hydraulic Crimping Tool
PT-541	Die Set, 0.324 Hex, Hydraulic Hand Crimper
PT-005	Fiber Optic Termini Crimp Tool, 2mm & 3mm (Hex Sizes .100 / .147)

TORQUE TABLE

Component	Backshell / Backnut	Strain Relief	Set Screws	Socket Head Cap Screw
Torque Values	48 – 53 in-lb	48 – 53 in-lb	3 – 4 in-lb	2 – 3 in-lb
	5.5 – 6.0 N • m	5.5 – 6.0 N • m	.34 – .45 N • m	.23 – .34 N • m

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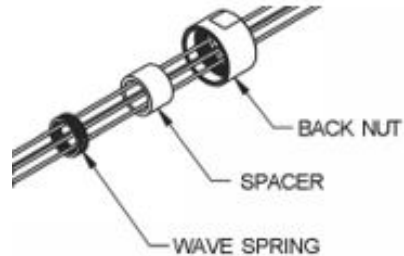


BACK NUT ONLY ASSEMBLIES (900µm or 2mm Cable Option)

CABLE PREPARATION

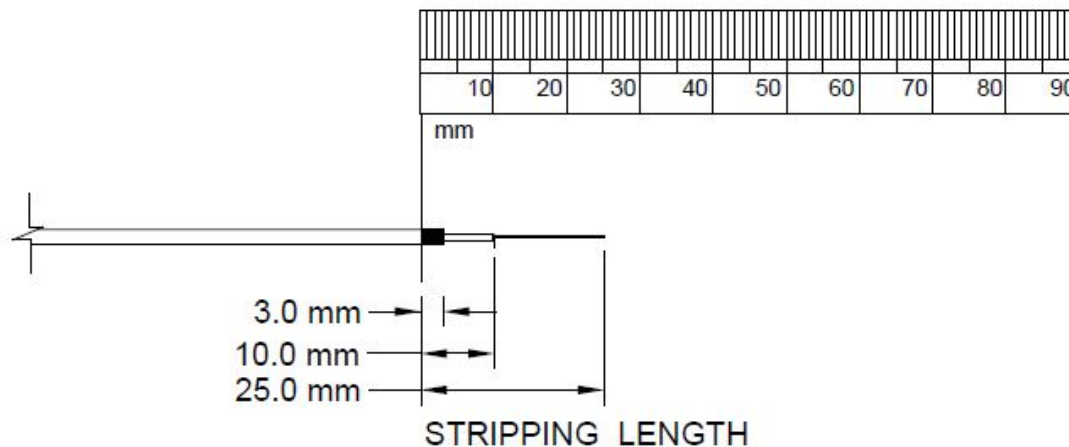
Slide the components onto the cable in the following order.

1. Back Nut
2. Spacer
3. Wave Spring



TERMINATE

Before stripping the fiber, slide a Spring onto the jacket of the fiber. For a 2mm cable option, first slide the Crimp Sleeve onto the jacket and then the Spring. Use the stripping length diagram below to strip the fiber. For the 2mm cable option, leave a small amount of Kevlar to slide underneath the Crimp Sleeve during crimping.



For a 900µm Buffer Fiber

Thread the bare fiber into the back of a Termini making sure that the fiber slides through to the other end of the ferrule. Apply Epoxy EPO-TEK-353 inside the base of the Termini so that the 900µm Buffer Fiber Jacket stays in place.

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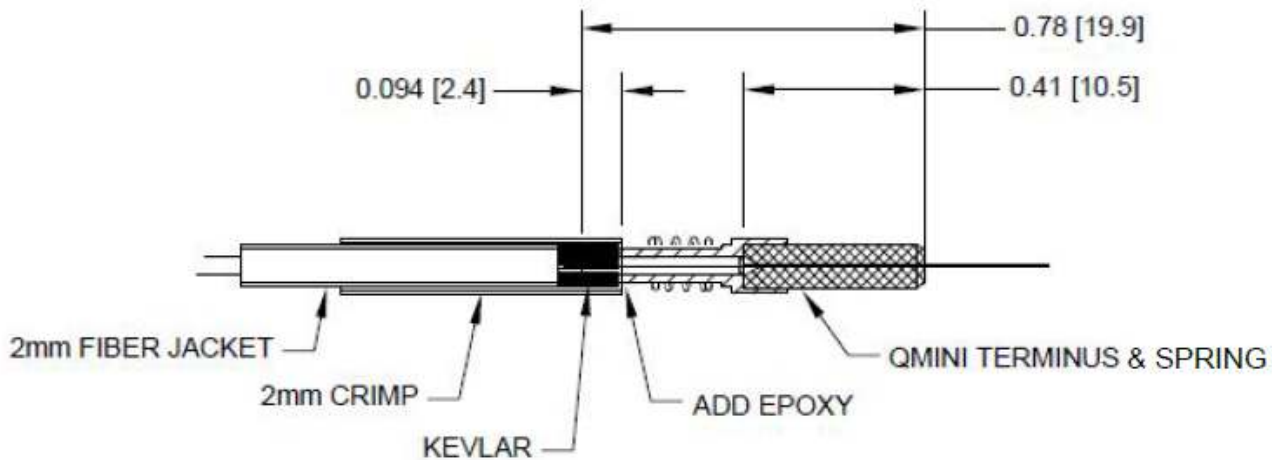
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For a 2mm Buffer Jacket

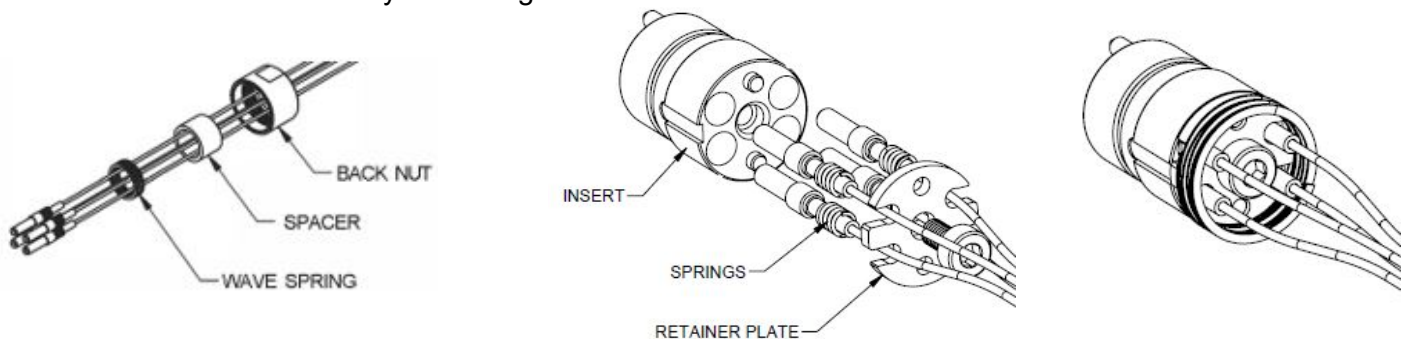
Thread the bare fiber through the back of the Termini making sure that the fiber slides through the other end of the ferrule. Use the diagram below to determine the placement of the Crimp Sleeve. Slide the Kevlar under the Crimp Sleeve and apply Epoxy EPO-TEK-353 or equivalent. Use Fiber Optic Termini Crimp Tool PT-005 (Hex Size .100) to crimp the Crimp Sleeve into place. After crimping, the Spring should float slightly between the base of the Termini and the top of the Crimp Sleeve. Repeat for all fibers.



For Termination and Polishing details, reference CAI-TERM-01.

POPULATE THE INSERT

Insert the Fiber Optic Termini into the back of the Insert Cavities. Place the Termini Retainer Plate between the 900 μ m or 2mm fibers making sure that the springs are between the Fiber Optic Termini and Termini Retainer Plate. Apply a drop of Loctite 222 to the Socket Head Cap Screw and use Hex Tool PT-504 to screw the Termini Retainer Plate into the Insert. Torque the Socket Head Screw to the values in the above Torque Table using Torque-Measuring Head Drive PT-590 and Bit Size 2.5 mm PT-599. Use a pair of Long Nose Pliers PT-532 to ensure the termini are fully seated against the ball lenses.



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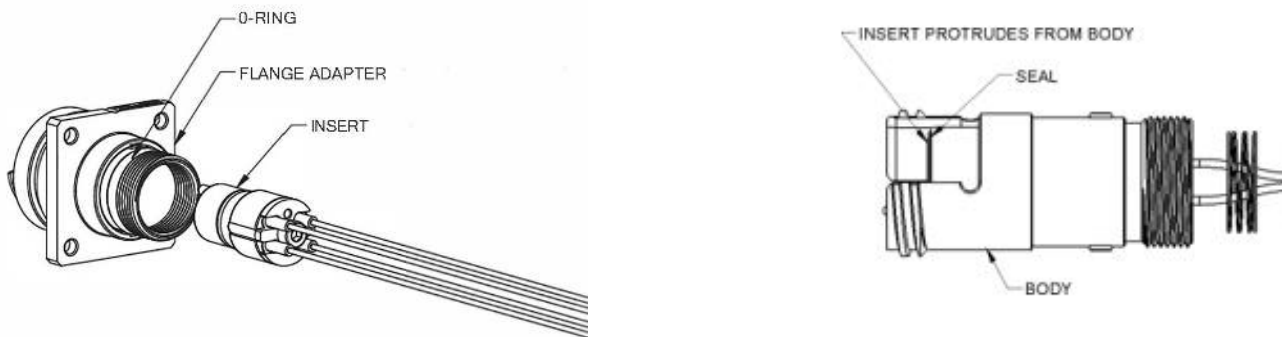
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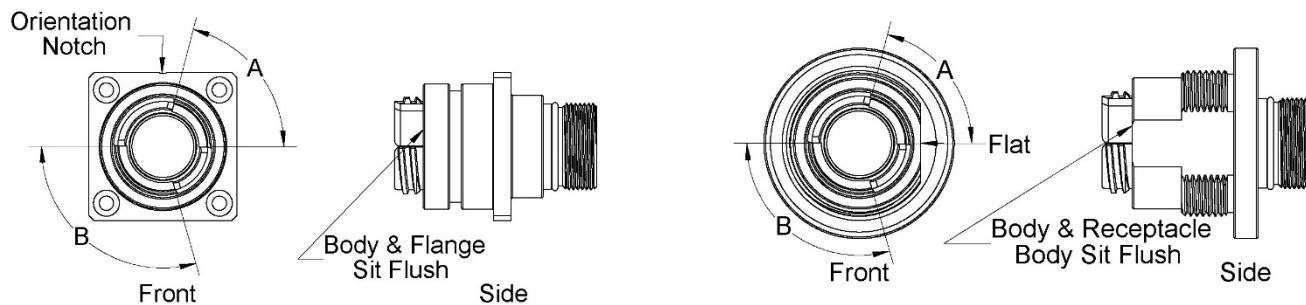


FINAL ASSEMBLY

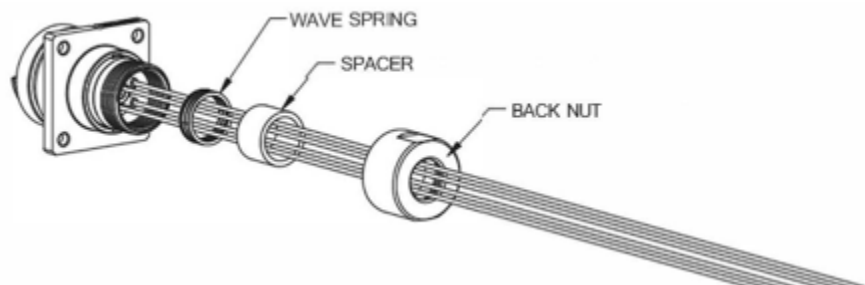
Use the Hex Driver PT-504 to align the key and install the insert into the Jam Nut or Flange Adapter Body. Rotate the body clockwise until the insert locates internal key. Push the insert forward. The Insert should protrude from the front face of the body to indicate it is seated properly. The seal should be visible around the insert as seen in the image below.



NOTE: Orientation of the connectors is seen below



Slide the Wave Spring and Spacer forward and secure them flush against the back of the Receptacle Body. Place assembly in the 4" Drill Press Vise with 2 x Machined Plastic Jaws with Groove PT-591 and use the Crow's Foot Wrench PT-536 with the Dial Torque Measuring Wrench PT-506 to torque the Back Nut to the values in the above Torque Table.



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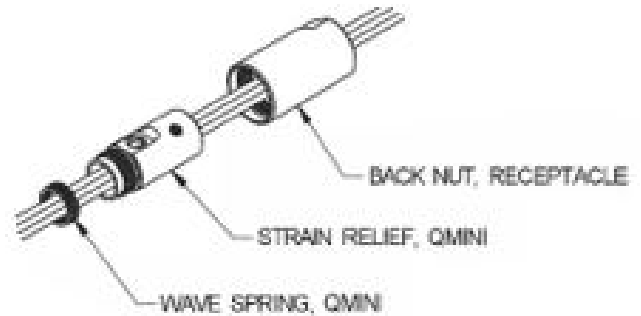


LOW PROFILE BACKSHELL ASSEMBLIES (4x2mm Cable Option OR 4.5mm – 7.5mm Cable Option)

CABLE PREPARATION

Slide the components onto the cable in this order
(See image on right):

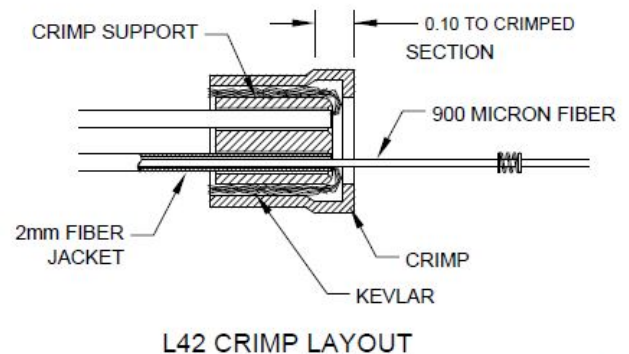
1. Back Nut
2. Strain Relief
3. Wave Spring



STRIP CABLE

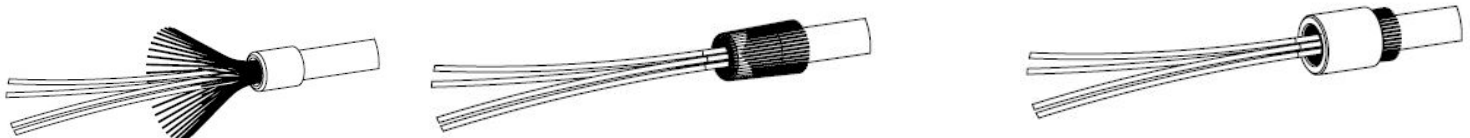
For a 4x2mm Cable Option

Strip the fiber jacket leaving extra Kevlar. Slide the 900µm fiber and Kevlar thru the hole in the 4-Channel Crimp Support. Slide the fiber jacket into the hole up to the front face of the support. Repeat for each channel. Wrap the Kevlar around the 4-Channel Crimp Support. Install the Crimp over the 900µm fibers and Secure with tape for crimping after termination and polishing.



For a 4.5mm – 7.5mm Cable Option

Strip cable jacket approximately 4" (100 mm) from end and place Crimp Support over fiber and Kevlar so that it stops at the end of the jacket. For a 4.5mm to 7.5mm Cable Option, bend Kevlar back over the Crimp Support. Slide second Crimp over Kevlar and Crimp Support and secure with tape for crimping after termination and polishing.



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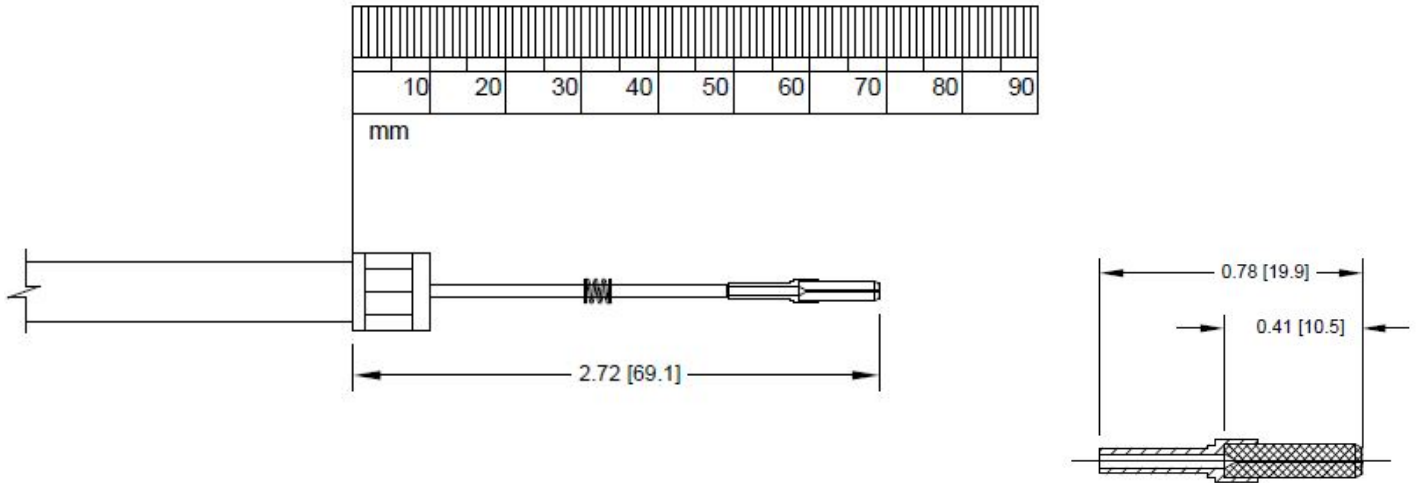
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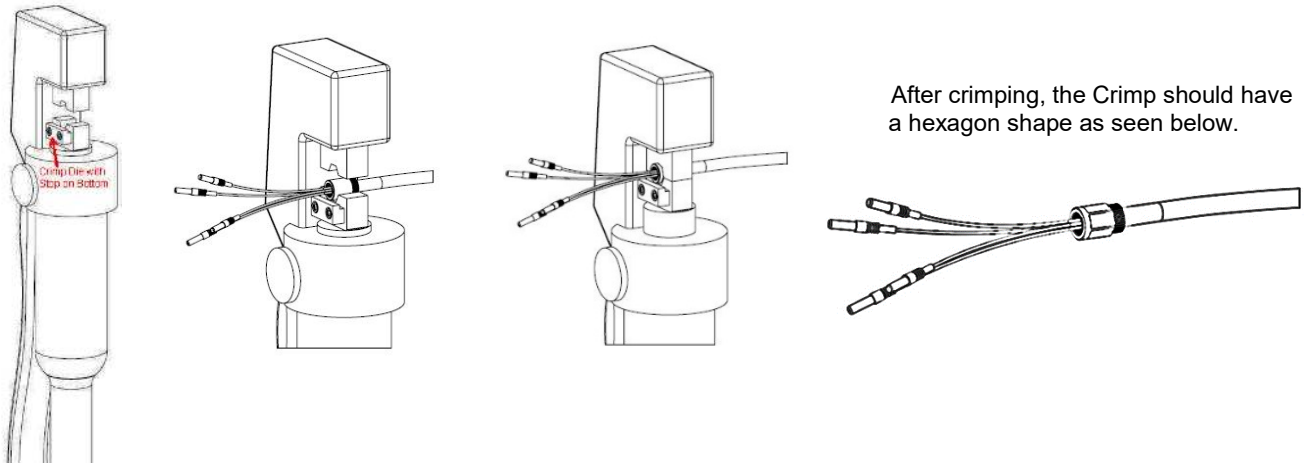
TERMINATE

Use the Stripping Length Diagram seen below to Terminate and Polish the Fiber Optic Termini. Be sure to include a spring on each of the fibers. For Termination and Polishing details, reference CAI-TERM-01.



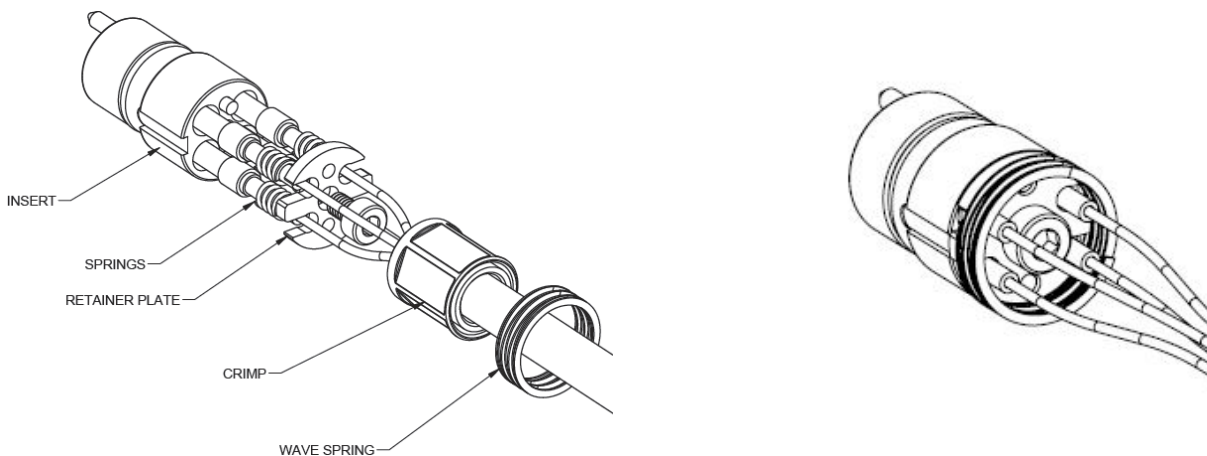
CRIMP TO CABLE

Remove tape after polishing the Fiber Optic Termini. Use Kevlar Scissors PT-062 to remove any excess Kevlar that is sticking out from the Crimp. Setup the Hydraulic Crimping tool PT-540 with the Die Set PT-541. The Crimp Die with Stop needs to be placed on the bottom facing out and with the Crimp against the stop as seen in the image below. Turn the knob clockwise on the Hydraulic Crimper, so that the handles can be pumped to crimp. Place the cable in the lower Crimp Die with the fiber facing out. Pump the handles until the Crimp Dies are touching. Release crimp by turning knob counterclockwise.



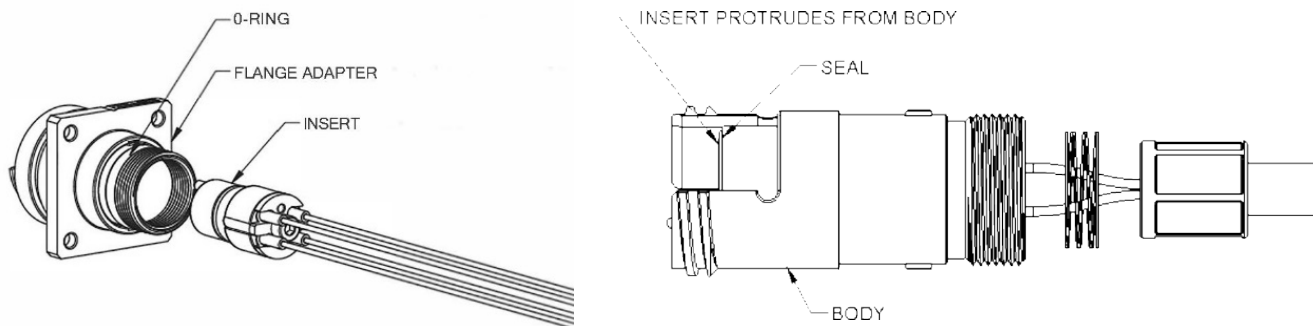
POPULATE THE INSERT

Insert the Fiber Optic Termini into the back of the Insert Cavities. Place the Termini Retainer Plate between the 900 μ m fibers making sure that the springs are between the Fiber Optic Termini and Termini Retainer Plate. Apply a drop of Loctite 222 to the Socket Head Cap Screw and use Hex Tool PT-504 to screw the Termini Retainer Plate into the Insert. Torque the Socket Head Screw to the values in the above Torque Table using Torque-Measuring Head Drive PT-590 and Bit Size 2.5 mm PT-599. Use a pair of Long Nose Pliers PT- 532 to ensure the termini are fully seated against the ball lenses.



FINAL ASSEMBLY

Use the Hex Driver PT-504 to align the key and install the insert into the Jam Nut or Flange Adapter Body. Rotate the body clockwise until the insert locates internal key. Push the insert forward. The Insert should protrude from the front face of the body to indicate it is seated properly. The seal should be visible around the insert as seen in the image below.



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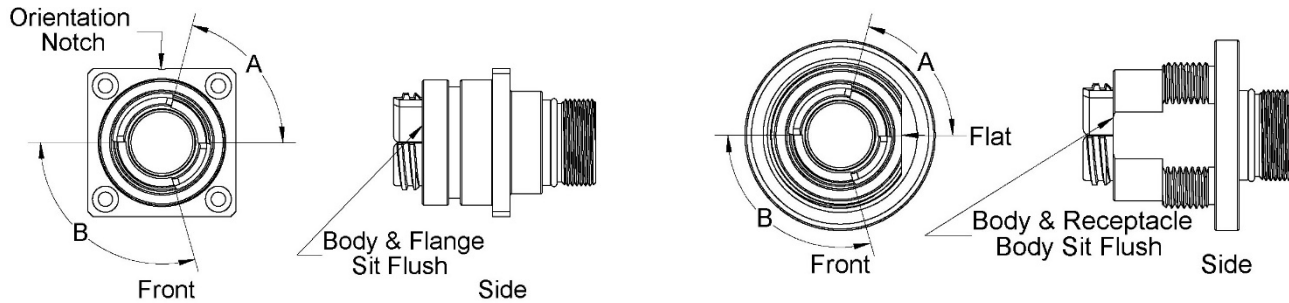
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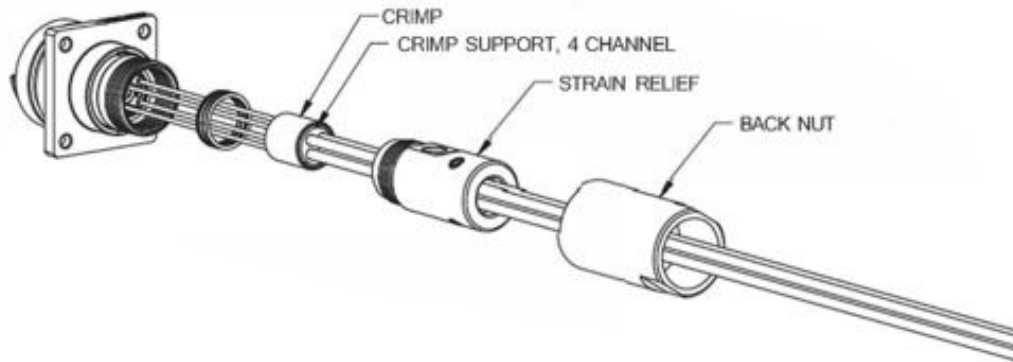
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NOTE: Orientation of the connectors is seen below



Slide the Wave Spring and Strain Relief into place. Hand tighten the Strain Relief. Check the fiber through the holes in the Strain Relief to make sure they are not twisted or kinked. Place assembly in the 4" Drill Press Vise with 2 x Machined Plastic Jaws with Groove PT-591 and use the Crow's Foot Wrench PT-536 with the Dial Torque Measuring Wrench PT-506 to torque the Strain Relief to the values in the above Torque Table. Use Cable to pull Crimp to bottom of Strain Relief. Use the Hex Driver PT-501 to tighten the Set Screws on the strain relief to lock the crimp into place. Torque the Set Screws using Torque-Measuring Hex Drive PT-590 and Hex Bit 1/16-inch PT-599 to the values in the above Torque Table. Perform a final visual check by looking through the holes of the Strain Relief to make sure that the fiber is not twisted or kinked. Hand tighten the Back Nut and then Torque it using the same torque tools to the values in the Torque Table above.



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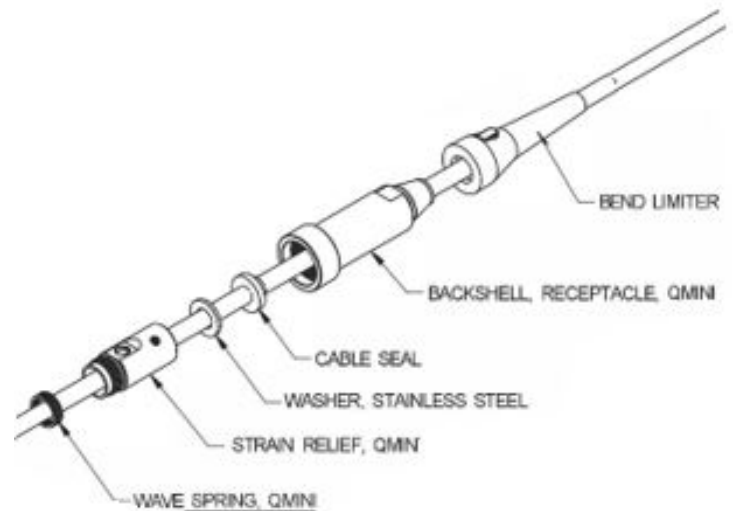


BACKSHELL (4.5mm – 7.5mm Cable Option)

CABLE PREPARATION

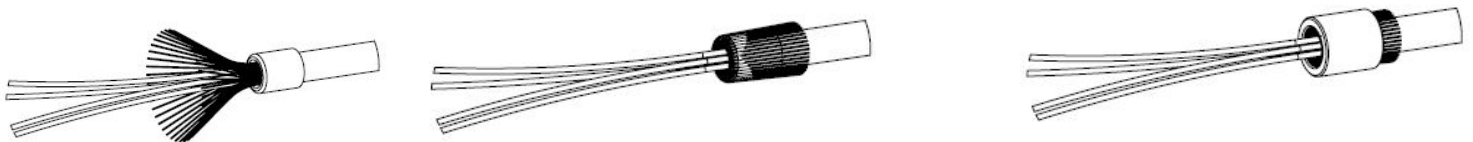
Slide the components onto the cable in this order
(See image on right):

1. Bend Limiter
2. Backshell
3. Cable Seal
4. Washer
5. Strain Relief
6. Wave Spring



STRIP CABLE

Strip cable jacket approximately 4" (100 mm) from end and place Crimp Support over fiber and Kevlar so that it stops at the end of the jacket. Bend Kevlar back over the Crimp Support. Slide second Crimp over Kevlar and Crimp Support and secure with tape for crimping after termination and polishing.



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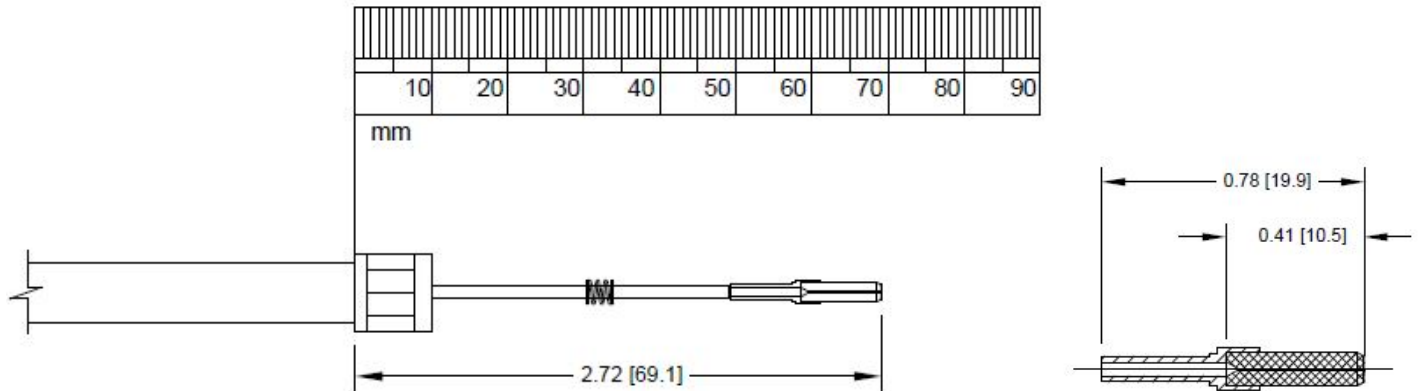
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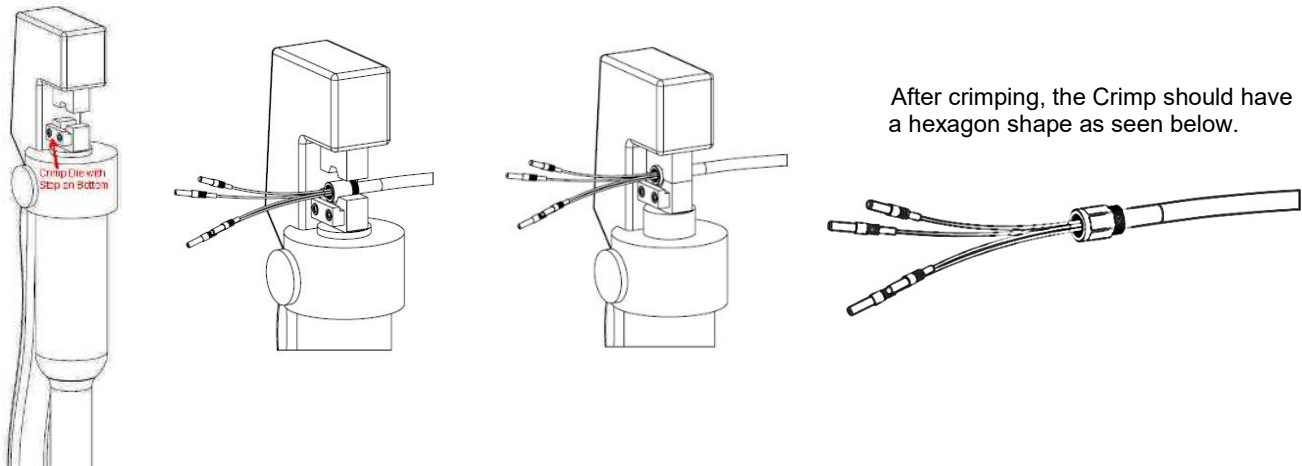
TERMINATE

Use the Stripping Length Diagram seen below to Terminate and Polish the Fiber Optic Termini. Be sure to include a spring on each of the fibers. For Termination and Polishing details, reference CAI-TERM-01.



CRIMP TO CABLE

Remove tape after polishing the Fiber Optic Termini. Use Kevlar Scissors PT-062 to remove any excess Kevlar that is sticking out from the Crimp. Setup the Hydraulic Crimping tool PT-540 with the Die Set PT-541. The Crimp Die with Stop needs to be placed on the bottom facing out and with the Crimp against the stop as seen in the image below. Turn the knob clockwise on the Hydraulic Crimper, so that the handles can be pumped to crimp. Place the cable in the lower Crimp Die with the fiber facing out. Pump the handles until the Crimp Dies are touching. Release crimp by turning knob counterclockwise.



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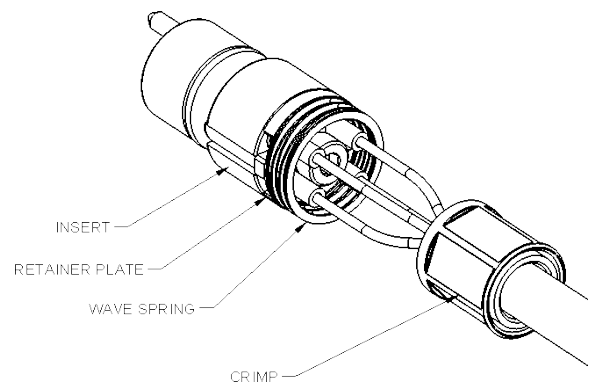
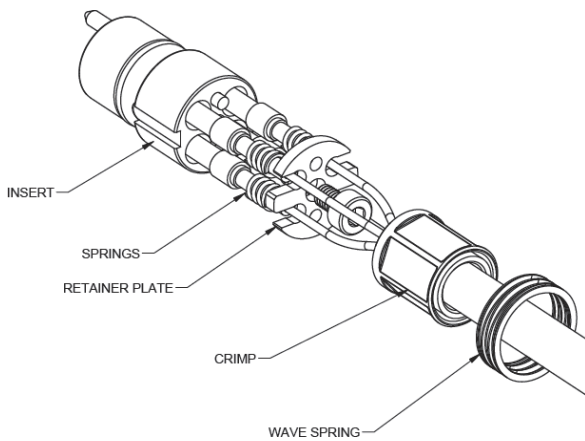
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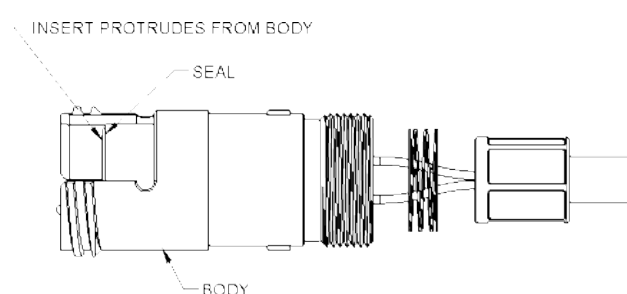
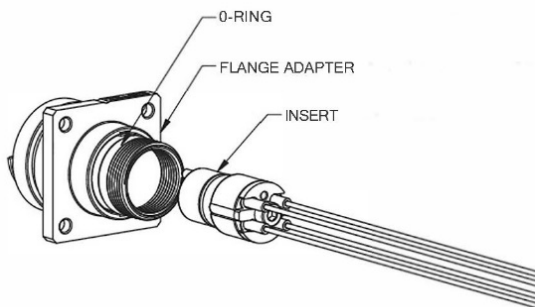
POPULATE THE INSERT

Insert the Fiber Optic Termini into the back of the Insert Cavities. Place the Termini Retainer Plate between the 900 μ m fibers making sure that the springs are between the Fiber Optic Termini and Termini Retainer Plate. Apply a drop of Loctite 222 to the Socket Head Cap Screw and use Hex Tool PT-504 to screw the Termini Retainer Plate into the Insert. Torque the Socket Head Screw to the values in the above Torque Table using Torque-Measuring Head Drive PT-590 and Bit Size 2.5 mm PT-599. Use a pair of Long Nose Pliers PT- 532 to ensure the termini are fully seated against the ball lenses.



FINAL ASSEMBLY

Use the Hex Driver PT-504 to align the key and install the insert into the Jam Nut or Flange Adapter Body. Rotate the body clockwise until the insert locates internal key. Push the insert forward. The Insert should protrude from the front face of the body to indicate it is seated properly. The seal should be visible around the insert as seen in the image below.



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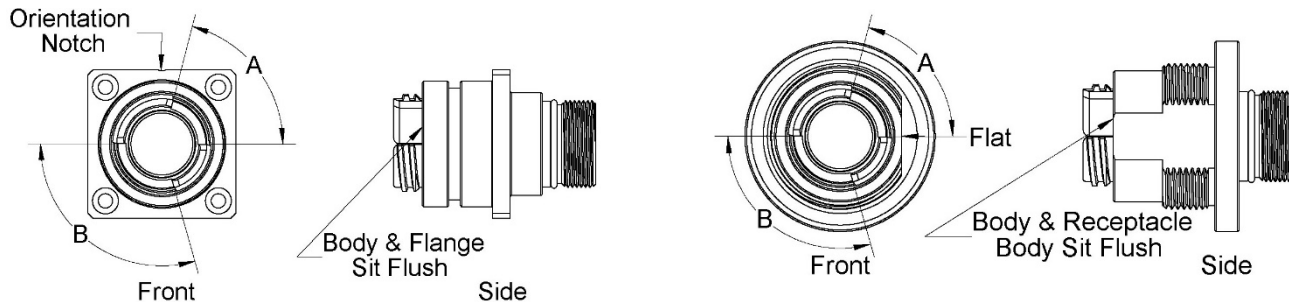
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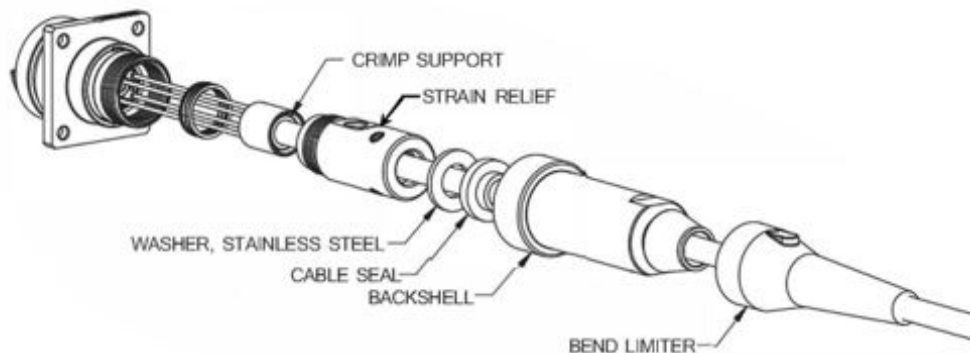


NOTE: Orientation of the connectors is seen below



Slide the Wave Spring and Strain Relief into place. Hand tighten the Strain Relief. Check the fiber through the holes in the Strain Relief to make sure they are not twisted or kinked. Place assembly in the 4" Drill Press Vise with 2 x Machined Plastic Jaws with Groove PT-591 and use the Crow's Foot Wrench PT-536 with the Dial Torque Measuring Wrench PT-506 to torque the Strain Relief to the values in the above Torque Table. Use Cable to pull Crimp to bottom of Strain Relief. Use the Hex Driver PT-501 to tighten the Set Screws on the strain relief to lock the crimp into place. Torque the Set Screws using Torque-Measuring Hex Drive PT-590 and Hex Bit 1/16-inch PT-599 to the values in the above Torque Table.

Perform a final visual check by looking through the holes of the Strain Relief to make sure that the fiber is not twisted or kinked. Slide the Washer and the Cable Seal to the base of the Strain Relief. Slide the Backshell into position and hand-tighten it. Torque the Backshell using the Crow's Foot Wrench PT-536 with the Dial Torque Measuring Wrench PT-506 to the values in the above Torque Table. Slide the bend limiter into position and snap into place.



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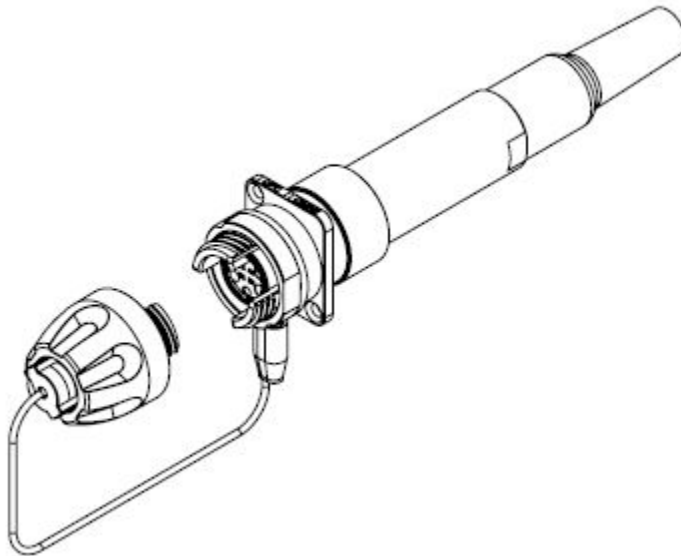


BACKSHELL (7.6mm – 10.5mm Cable Option)

Follow prior instructions labeled “BACKSHELL (4.5mm – 7.5mm Cable Option)”.

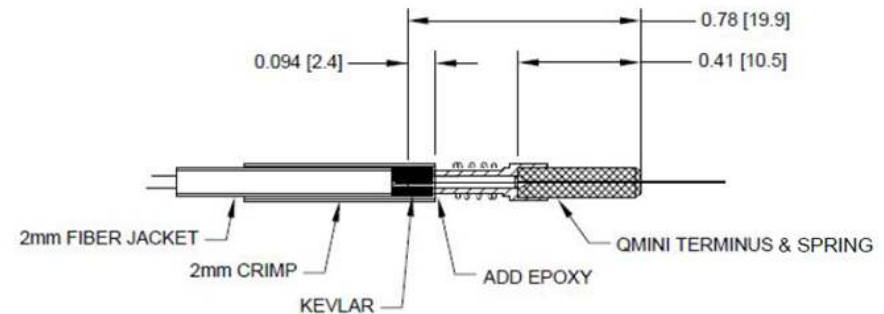
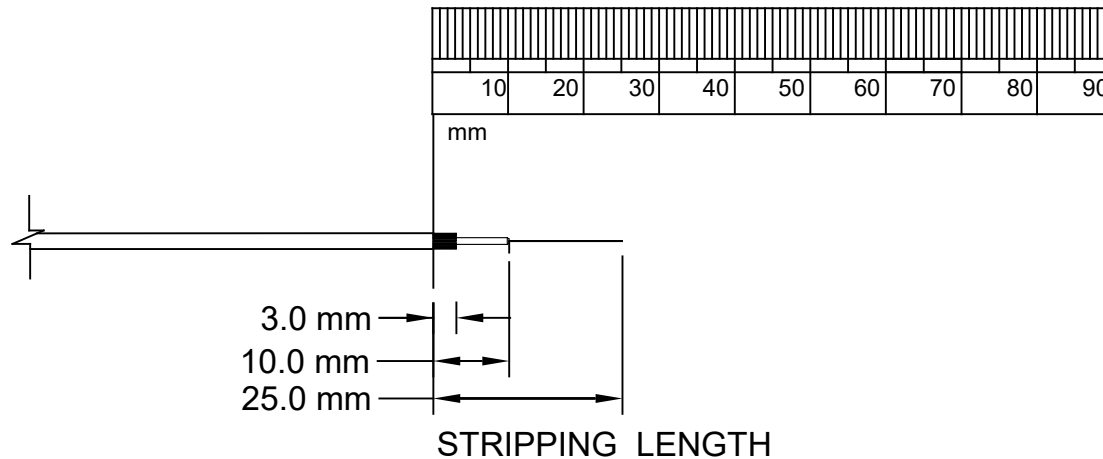
For Heat Shrink Bend Limiter Installation

Apply an adhesive (Loctite Stik’N Seal Outdoor Adhesive or similar for rubber applications) on the inside of the Heat Shrink Bend Limiter. Slide it up towards the base of the Backshell and activate the heat shrink.



QMINI CONNECTOR

RECEPTACLE SIMPLEX CABLE



CABLE PREPARATION



ENGINEERED FIBER OPTIC SOLUTIONS

QPC Fiber Optic, LLC

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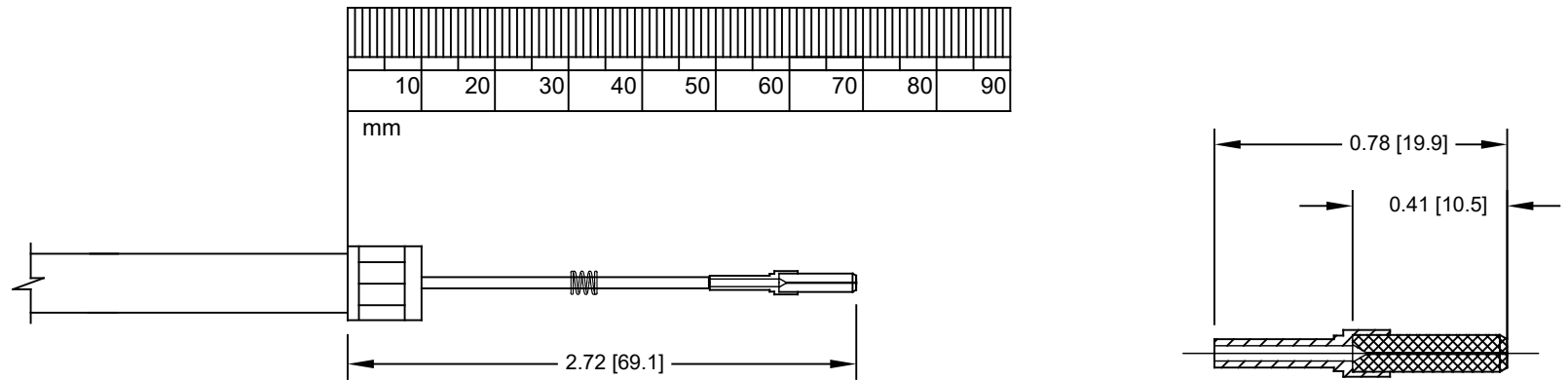
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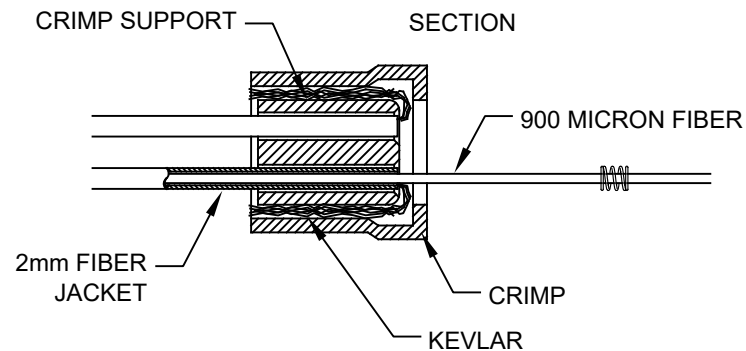
REV.	DESCRIPTION	DATE	APPROVED
REVISIONS			

QMINI CONNECTOR

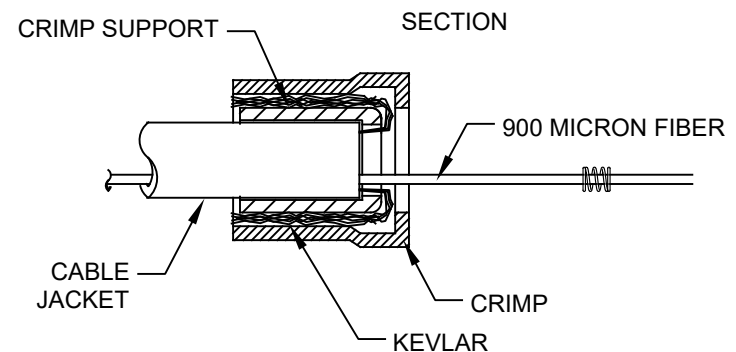
PLUG and RECEPTACLE with BACKSHELL



4x2mm Cable Option



4.5mm - 7.5mm Cable Option



CABLE PREPARATION



ENGINEERED FIBER OPTIC SOLUTIONS
QPC Fiber Optic, LLC

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