Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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VEAM

CIR Series Assembly Guide

ITT

ENGINEERED FOR LIFE

ITT Corporation

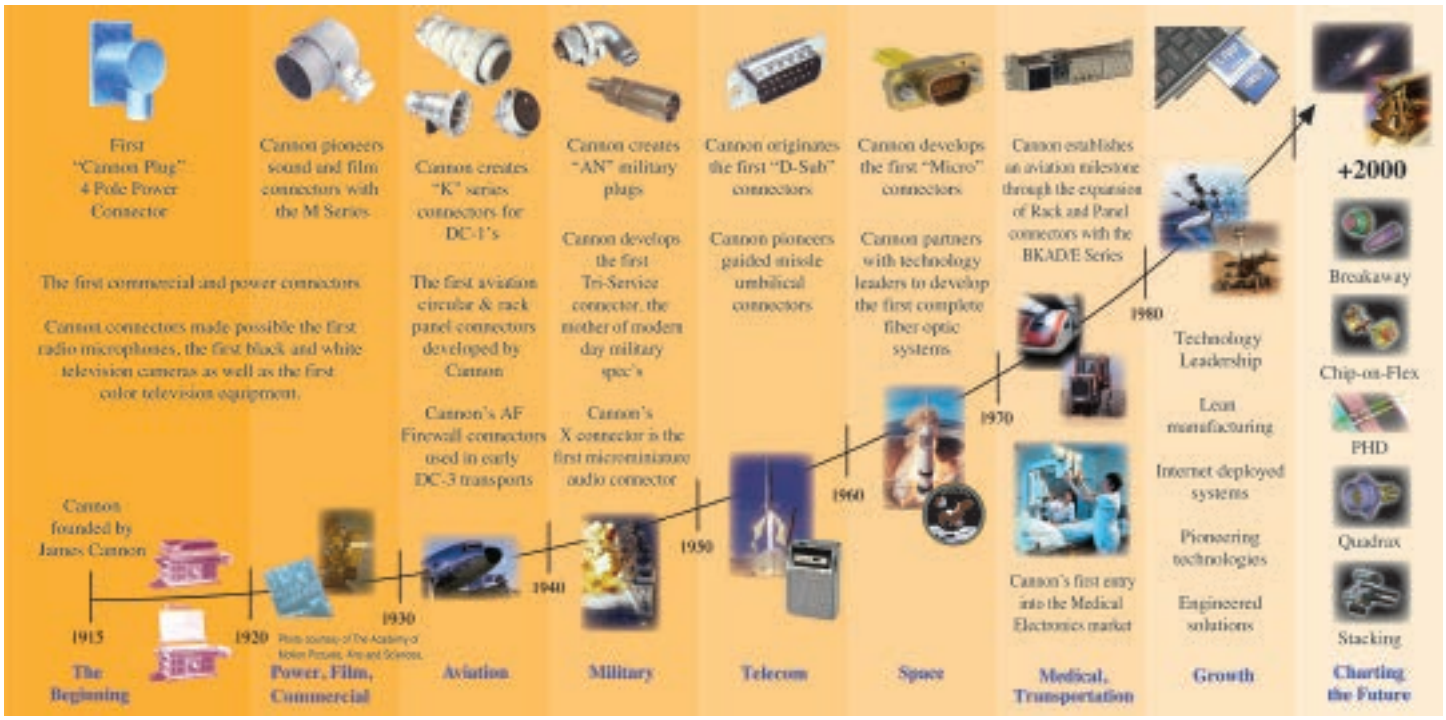
A Historical Achievement of Technology Leadership

Defining and Championing Innovation

Showcasing a portfolio of creativity, ITT's "Engineered For Life" execution embraces products which have become ubiquitous in a broad collection of markets including: Military/Aerospace, Civil Aircraft, Industrial Instrumentation, Medical, Oil & Gas, Energy, Transportation, Telecom/Handset, Computer, Consumer, and Automotive.

ITT's rich interconnect history embraces contributions to both technological breakthroughs and social movements. With one of the industry's broadest product offerings, ITT's interconnect products have supported:

- Every Free World space mission, bringing the universe to our doorstep.
- Motion picture, radio, and television equipment, serving laughter and entertainment to millions.
- Commercial and military communications systems, linking the voices of the world.
- Computerized tools, reshaping the information highway.
- Aircraft, rapid transit, and automobiles, mobilizing our expanding society.
- Oil and natural gas production, powering the world's economies.
- Agricultural equipment, attacking the roots of world hunger.



Interconnect Solutions

Interconnect Solutions is a division of the multi-national ITT Corporation, a $11.6 billion dollar global enterprise representing the brands Cannon, VEAM, and BIW. Our connector portfolio remains the most extensive in the industry offering the most reliable and cost effective range of interconnect solutions. These innovations have enabled ITT to provide products and technologies to such markets as:

- Automotive
- Computer/Consumer
- Industrial/Instrumentation
- Military/Aerospace
- Oil Fields
- Telecom/Handset
- Transportation

When you specify a Interconnect Solutions connector, you can rely on a product designed, developed, and manufactured to the highest quality and reliability standards. This tradition of excellence is based on ITT's corporate culture of operating its businesses under the principles of Six Sigma. At ITT, Six Sigma is not just a quality philosophy but a complete corporate culture that drives the entire business. Our Value Based Management and Value Based Product Development systems are two cornerstones that allow for the development of both leadership and product engineering principles, ensuring the correct industry leading products are developed to the accepted market driven lead times. These principles have allowed ITT to become the market leader in all of our business portfolios.

Six Sigma Manufacturing

ITT operates manufacturing facilities in the United States, Germany, Italy, Mexico, China, Japan and the UK, all of which have particular product area strengths allowing ITT to offer a truly global footprint to our customers. Our facilities are world class and accommodate full vertical integration utilizing the latest manufacturing technologies including: automated and robotic machining centers, Super Market manufacturing cells, Kanban pull systems, and automated electrical, mechanical, and optical test and inspection equipment. The combination of our manufacturing strength and our advanced manufacturing facilities allows ITT to offer products at market driven prices. Our capabilities, especially in robotics, computerized precision tooling, Kaizen Project Management, Six Sigma tools, and testing, give ITT the most optimized global manufacturing footprint in the interconnect industry.

The Custom Difference

As the industry leader in harsh environment interconnect applications, ITT's world class engineering teams will work directly with our customers to design and develop cost effective solutions for their applications. In many cases we may modify one of our standard designs to ensure a highly reliable solution where timing is critical. Yet, in those cases where a complete custom interconnect solution is required, ITT will work with our customer's Engineers to design an interconnect solution which will be cost effective yet highly reliable. As professional consultants, our Engineering teams will provide a thorough systems and mechanical analysis of any proposed solution. These analyses provide our customers with sophisticated electrical signal and mechanical characterizations to determine the best solution for their application.

RoHS Compliance Information

ITT has implemented a strict parts control plan for all ITT electronics plants worldwide that allows the Cannon, VEAM, and BIW connector product portfolios to meet the requirements of European Union Directive 2002/95/EC better know as the Reduction of Hazardous Substances initiative. As appropriate, specific Cannon, VEAM, and BIW products may be ordered with an R prefix number which insures our customers will receive RoHS compliant parts for their commercial electronics applications and equipment. Since most RoHS hazardous substances center around specific metal plating and lead solder coatings, ITT's products for RoHS compliance are available in the following plating finishes: electroless nickel, stainless steel, Anodize over aluminum and Gold plating. It should be noted that gold plating would be recommended as the replacement for tin-lead solder when ordering board mount connectors.

RoHS COMPLIANT

ITT

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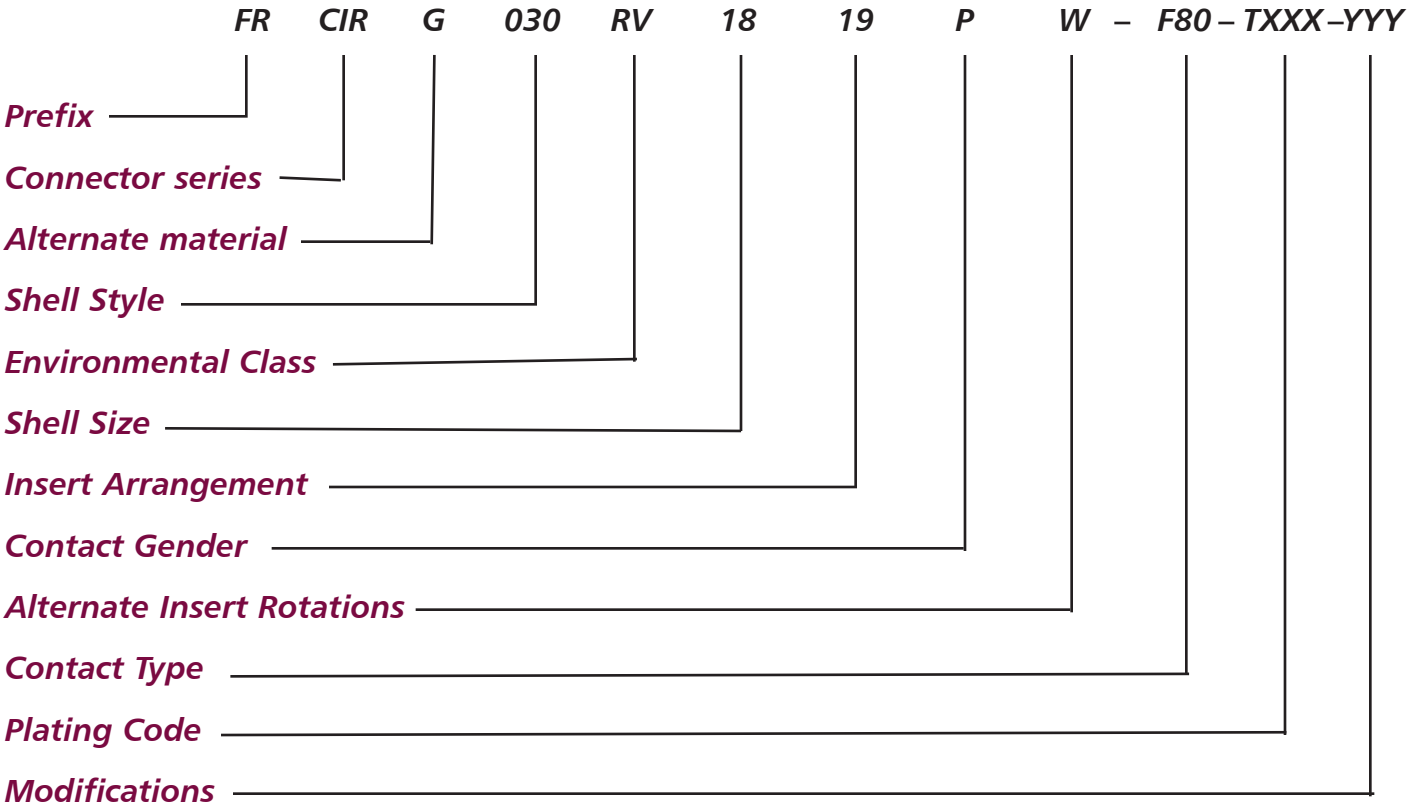


Table I

Insert Arrangement Service Rating

Service Rating	Operating Voltage DC (at sea level)	Operating Voltage AC (at sea level)
I	250 V	200 V
A	700 V	500 V
D	1250 V	900 V
E	1750 V	1250 V
B	2450 V	1750 V
C	4200 V	3000 V

Table II

Contact Rating

Contact Size	Maximum Current	Rated And Test Current *	Potential Drop Millivolts Maximum *
20	7.5 A	7.5 A	83 mV
18	10 A	7.5 A	83 mV
16-16S	22 A	13 A	74 mV
12	41 A	23 A	63 mV
8	73 A	46 A	65 mV
4	135 A	80 A	58 mV
0	245 A	150 A	53 mV
4/0	350 A	225 A	53 mV

Table III

Dielectric Strength (Standard at Seal Level Conditions)

Service Rating	Minimum Flashover AC RMS	Test Voltage AC RMS (Hi Pot)
I	1400 V	1000 V
A	2800 V	2000 V
D	3600 V	2800 V
E	4500 V	3500 V
B	5700 V	4500 V
C	8500 V	7000 V

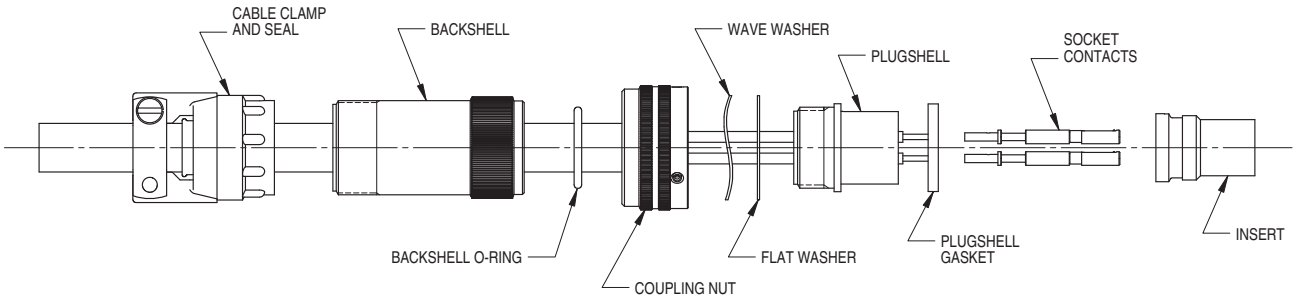


Figure 1

Exploded View of a typical "Plug"connector

All mating connectors can be classified as either plugs or receptacles. A mating set, consisting of a plug and a receptacle, can be male and female or female and male. A general rule of thumb is to specify socket contacts in the connector identified as the current source. A typical plug connector is illustrated in Figure 1.

The Basic CIR Plug Connector

Plug Connector Description

The basic CIR plug connector consists of the following parts:

A. Plugshell- Holds the insulator (insert) and retains contacts.

B. Insert - Bonded plugshell insulator to hold contacts firmly. Not removable.

C. Contacts - Crimped or soldered to the wire depending on type. (Crimp contacts are supplied loose. Solder contacts are factory installed except for sizes 8, 4, and 0). Crimp contacts are designated by F80 in the part number.

D. Plugshell Gasket - Square cross section gasket used to seal the plugshell-receptacle interface when the connectors are mated.

E. Wave Washer - Ensures positive locking and dynamic seal compression when the connectors are coupled.

The basic VEAM plug design has a variety of accessories available including backshells, cable clamps, and wire sealing grommets with associated compression rings, and gland seals for jacketed cables and bushings. Proper selection of accessory hardware can protect your connections in harsh environments and avoid costly down time for repairs. Please consult the VEAM Technical Service Department for assistance in proper selection.

F. Flat Washer - Presents a smooth bearing surface for the wave washer.

G. Coupling Nut - Provides cam action to pull and lock mating plugs and receptacles. Also exerts a cam force for separating the connectors when uncoupling.

H. Backshell - An accessory which screws onto the rear of the plug or receptacle shell. Contains the wire terminations and provides an interface for other accessories - cable clamps, conduit terminations, etc. Note: Adequate backshell length is important to ensure sufficient working room.

I. Backshell O-Ring - Maintains a waterproof seal on the thread interface.

J. Cable Clamp - An accessory which screws onto a backshell to provide cable jacket seal and/or strain relief for individual wire bundles.

K. Grommet - Compressible elastomeric seal for individual wire terminations.

L. Compression Ring - A nylon or metal cone which compresses a grommet to seal on the individual conductors when the backshell is in position.

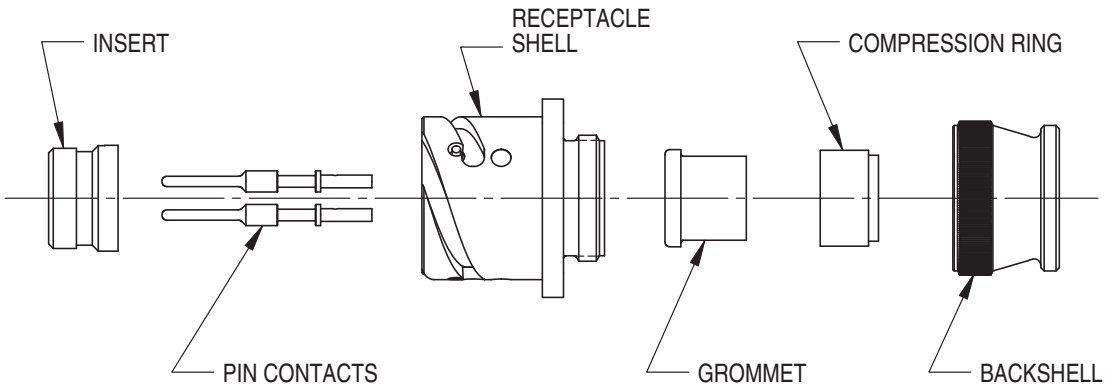


Figure 2

Exploded View of a typical "Receptacle"connector

The Basic CIR Receptacle Connector

Receptacle Parts Description

The basic parts of the receptacle connector are:

A. Receptacle Shell- Usually the fixed half of a mated connector pair. Coupling ramps provide cam action for mating or demating. A stainless steel lock ring at the top of the coupling ramp guarantees long service life and positive locking.

B. Insert - Contact insulator which is bonded within the receptacle to hold the contacts firmly. The insert is not removable.

C. Contacts - Crimped or soldered to the wire depending on type. (Crimp contacts are supplied loose. Solder contacts are factory installed except for sizes 8.,4, and 0).

D. Grommet - Resilient rubber wire sealing device prevents moisture entry into contact wire interface area.

All plug connector accessory hardware can be used with any receptacle connector.

E. Compression Ring - A nylon or metal cone which compresses a grommet to seal on the individual conductors when the backshell is in position.

F. Backshell - An accessory which screws onto the rear of the receptacle shell or plugshell. Contains the wire terminations. Holds grommet and compression ring and/or other accessories in place. A wide variety of backshells are available for various applications.

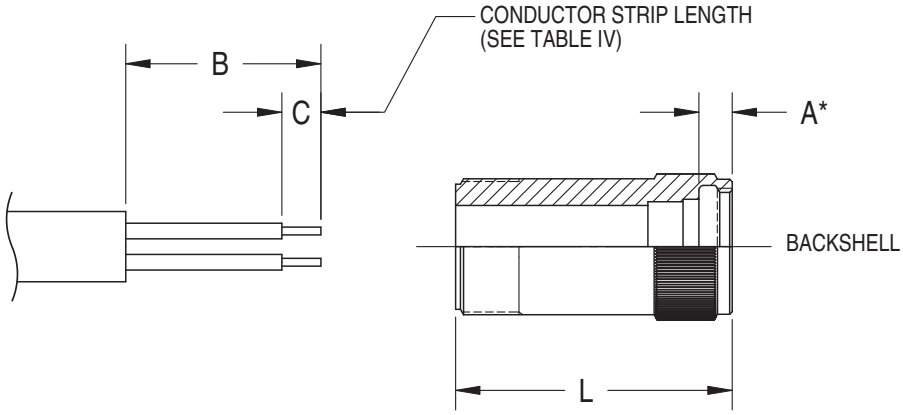


Figure 3

* - Dim. A is from the front of the backshell to the bases of the O-Ring groove

Jacketed Cable Termination

Procedure

Recommendation: As cables differ from manufacturer to manufacturer and even lot to lot from the same manufacturer we recommend you make up one assembly first to familiarize yourself with cable lay and wire cross overs.

A. When terminating a jacketed cable in application that require sealing the backshell onto the jacket, to guarantee effective sealing, the jacket strip length must be precisely determined. This ensures proper location of the gland seal in the cable clamp mechanism. Strip length for the jacket must also be maximized to permit adequate "working room." This permits the assembler to crimp contacts onto wires and insert them into connectors.

B. To calculate strip length for the jacket (Dimension B): Subtract Dimension A from Dimension L.

C. Use care in removing the jacket and any cable filler material. Cuts or nicks in the wire insulation can generate problems.

D. Strip individual wires according to Table IV below:

Table IV

Contact Size	Crimp Contact P/N		Conductor Strip Length Dimension C	
	Pin	Socket	(mm)	inch
20	46730-20	46731	(4.8)	.18
18	46740P	46740S	(4.8)	.18
16S	27911	27961	(6.4)	.25
16	27913	27963	(6.4)	.25
12	27914-26	27964-26	(8.5)	.33
8	27915	27935	(12.7)	.50
4	27916	27936	(12.7)	.50
0	27917	27937	(14.0)	.55
4/0	47107-165	47114-165	(23.0)	.90
	Solder Contact P/N			
	Pin	Socket		
16S	27901	27951	(6.4)	.25
16	27903	27953	(6.4)	.25
12	27904	27954	(9.5)	.37
8	27905	27925M	(12.7)	.50
4	27906	27926	(15.9)	.62
0	27907	27927	(16.0)	.63

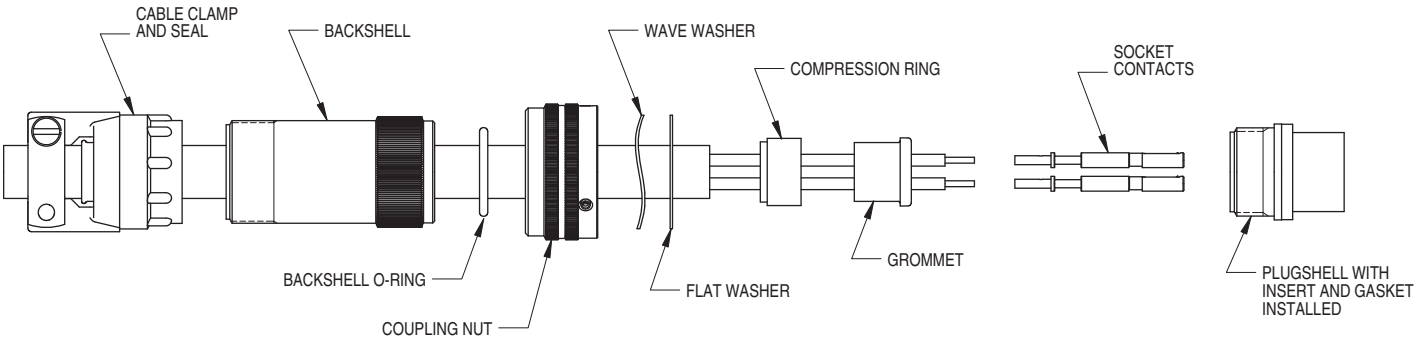


Figure 4

Jacketed Cable Connector Assembly Sequence

Procedure (continued)

E. Assemble the connector components onto the cable in the order shown in Figure 4.

F. Double check the cable clamp sealing range to be certain it is sized properly for your cable. Page 28, Dimension B.

G. Crimp contacts onto wires following the step-by-step instructions on pages 17-23.

H. Using the proper insertion tool (see page 32-33)*, with a straight motion, push the contacts from rear of the insert into the proper cavity until seated. See table V, on page 11 for seating dimensions.
* When installing size 12 or smaller female contacts, guide pins should be used to ease entry and prevent shaving the insert retention shoulders. See Page 12 for installation. Use isopropyl alcohol **only** as a lubricant. The extraction tool can be used to reposition the contacts if they are inserted too deeply.

I. Place flat washer and wave washer into the coupling nut and then slide forward over the plugshell.
Note: Wave washer split must bear against the flat washer.

J. Couple the plug onto a mating receptacle shell or dummy receptacle (clamp the receptacle horizontally in a vise).

K. Slide the wire sealing grommet** forward over the contact wire junctions. Make certain any alcohol has evaporated.

L. Slide the compression ring** forward over the rear of the grommet.

M. Check to make certain that the backshell O-ring** is installed into its internal groove.
** if supplied

N. Slide the backshell forward and screw it onto the rear of the plugshell. Proper torque values are shown in Table VI, page 12.

O. Slide the cable clamp (if provided) forward and screw onto the rear of the backshell using the same torque values. Use isopropyl alcohol **only** as a lubricant. Page 28 shows the clamp size and cable sealing range with and without a bushing.

P. Perform a continuity check to insure all wires in the cable are properly terminated. Label as required.

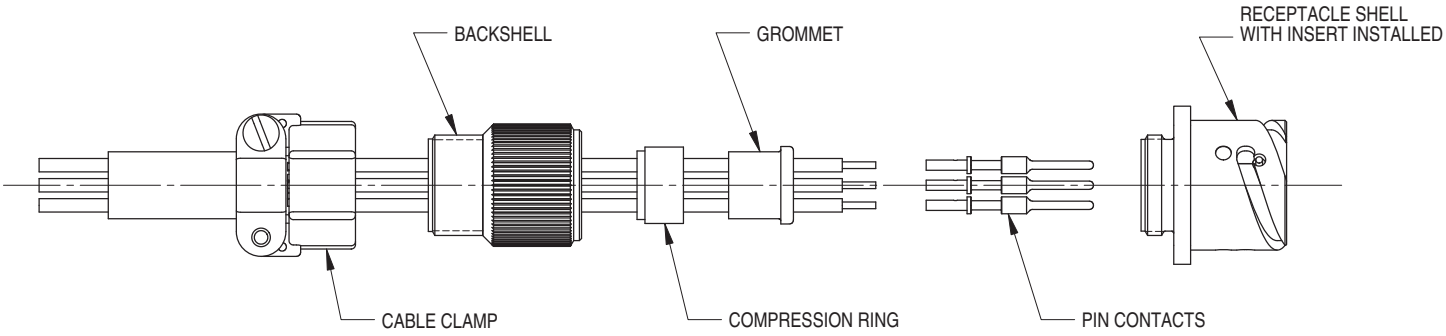


Figure 5

Individual Wire Termination Procedure (Shown on receptacle connector)

Consult our customer service department for seating dimensions of special insert arrangements: 16A-10, 18-1, 22-27, 24A-6, 24-2GM, 32A-69, 32-101, 32A-1, 36A-72, 40A-5.

Table V

SEATING DIMENSIONS		
SIZE	Pin Contact	Socket Contact
	S dim (± .032")	R dim (± .032")
20	.433	.059
18	.307	.118
16S	.095	.095
16	.280	.095
12	.095	.095
8*	.236	.200
8	.095	.095
4	.095	.095
0	.095	.095
4/0	.098	.098

Dimensions are in inches.
* (Coax)
Note: All contacts do not need to be the exact same height when seated but must fall within the seating dimensions and tolerances stated in Table V as measured from the top of the shell to the top of the contact (see Figure 6).

A. Strip ends of the wires according to Table IV, page 9.

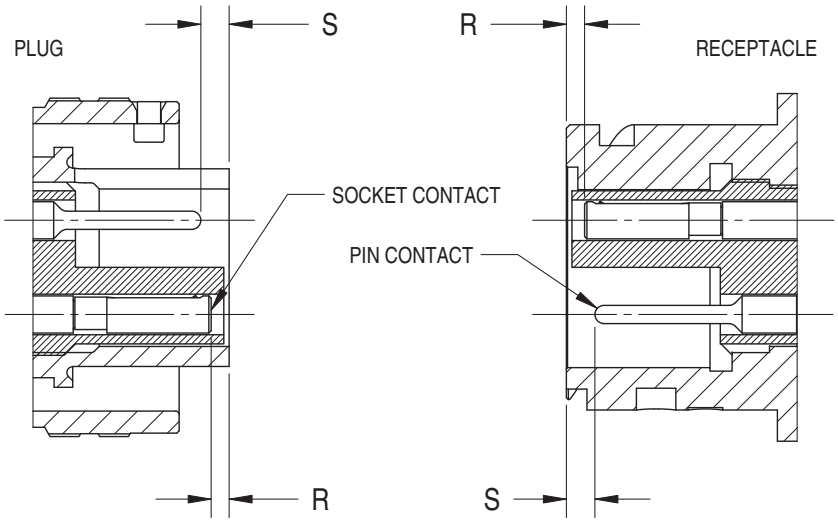
B. Slide connector components onto the cable in the order shown in Figure 5. Double check the cable clamp sealing range to be sure it is sized properly for your wire bundle (listed on page 27).
Important: Install wires through the grommet in the same orientation as they will be installed into the insert.

C. Crimp contacts onto wires following the step-by-step instructions on pages 17-23.

D. Grasp the receptacle flange gently in a vise to hold it firmly. Cushion the vise jaws to protect the connector finish.

E. Using the proper insertion tool (pages 32-33), push the contacts into the proper cavity with a straight push until seated. Use isopropyl alcohol **only** as a lubricant. The proper seating dimension is per Table V. Use the extraction tool to reposition the contacts if inserted too deeply.

Figure 6



Important: When installing size 12 or smaller female contacts, guide pins should be used to ease entry and prevent shaving of the shoulders in the insert (See figure 7). Use isopropyl alcohol **only** as a lubricant.

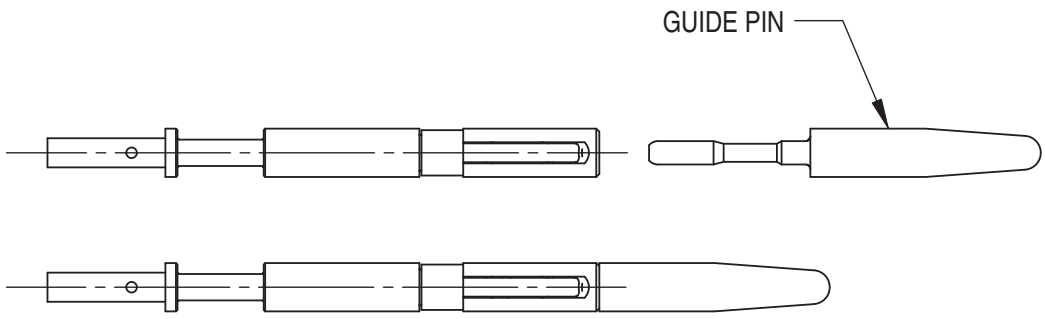


Figure 7

F. Slide the wire sealing grommet** forward over the contact wire junctions.

G. Slide the compression ring** forward over the rear of the grommet.

H. Be sure that the backshell O-ring** is installed into its internal groove.

I. Slide the backshell forward and screw onto the rear of the plugshell using a torque wrench or a strap wrench (see page 34). Proper torque values are showin in Table VI.

J. Slide the cable clamp** forward and screw onto the rear of the backshell using the same torque values.

K. Perform a continuity check to insure all wires in the cable are properly terminated. Label as required.

** if supplied

Table VI

Recommended Torque Forces Connector Backshells/Clamps			
Size	*In. lb Min/Max*	*Size*	*In. lb Min/Max*
10SL	26/31	22	87/104
14S	44/49	24	96/130
16	57/66	28	121/165
16S	57/66	32	130/182
18	61/69	36	165/235
20	69/87	40	182/347

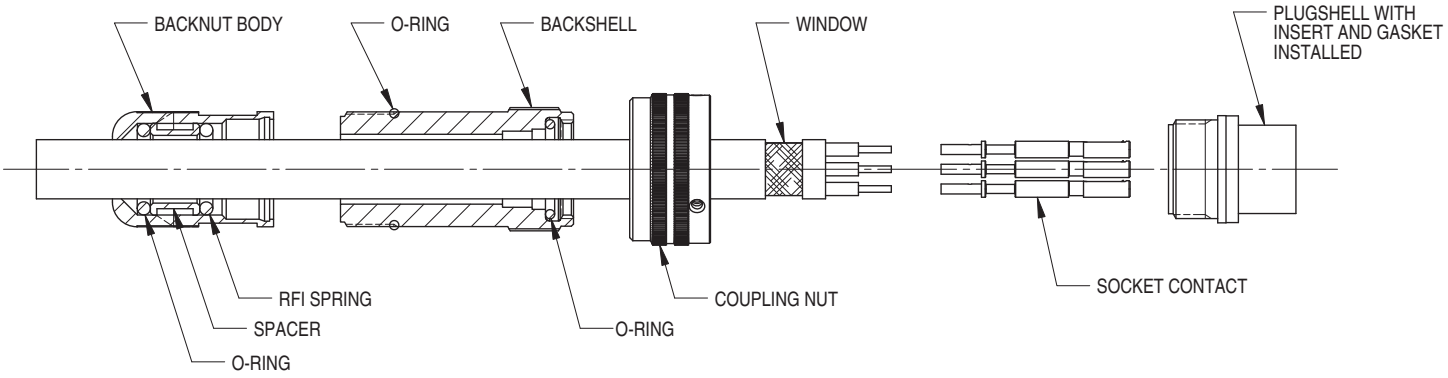
Styles WK1, SB

Termination of shielded cables is sometimes necessary to provide RFI or EMI assembly protection. The CIR Series has numerous methods for attaching shield braid to the connector backshell. Two of the most popular types are described below. For other types, consult our customer service department.

Style WK1 Termination

The Style WK1 termination method utilizes a stainless steel garter spring that concentrically closes to mechanically grip and electrically terminate the overall shield to the connector backshell. The assembly also incorporates an O-Ring. It closes down on the cable jacket providing a high pressure environmental seal.

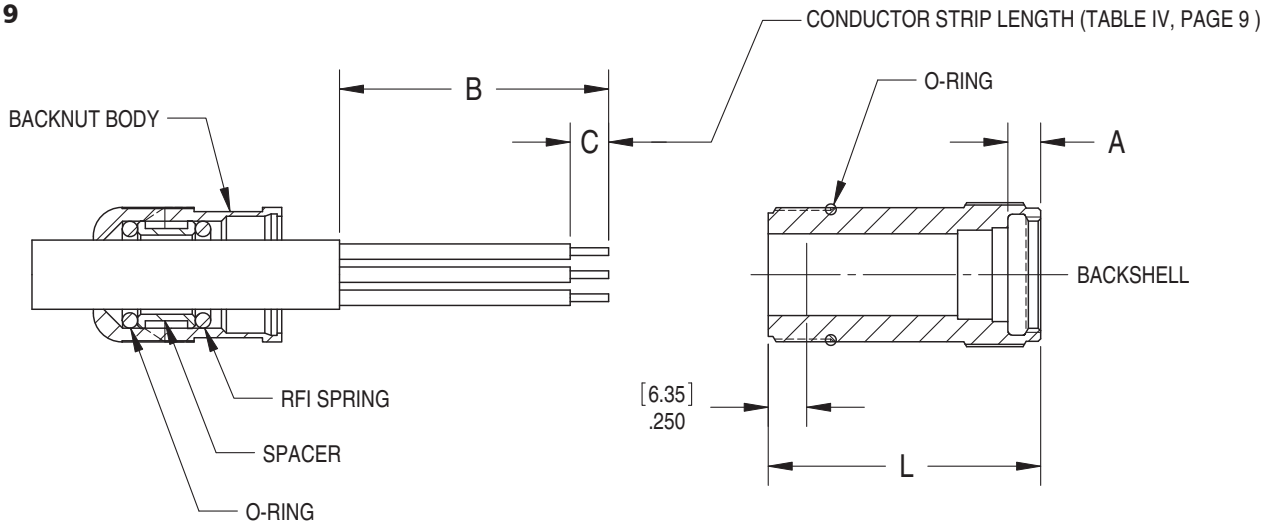
Figure 8



1. Strip the jacket and shield away from the individual conductors to a length corresponding to Dimension B - see Figure 10 and Table IV, page 9. Use caution. Do not nick the wire insulation.

To determine jacket strip length "B," subtract dimension "A" and .250 from "L." Dimension "A" is from the front of the backshell to the base of the O-Ring groove.

Figure 9



2. Open a "window" in the cable jacket .300 wide and .200 inches back from the stripped end as shown in Figure 10.

3. Strip the individual wires according to Dimension C, Table IV, page 9.

Figure 10

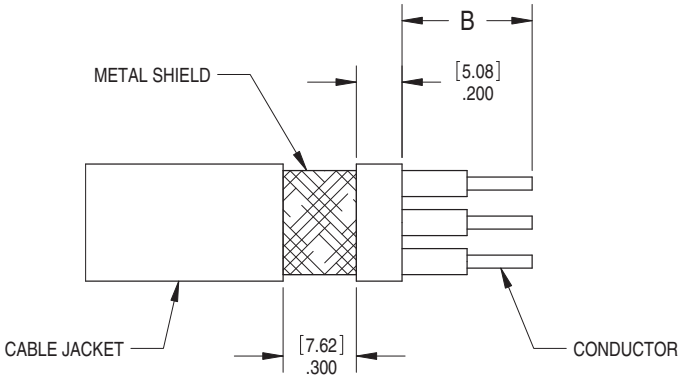


Table VI A
Backnut Assembly Torque Values

P/N Suffix Designation	Cable Range min	max	Inch Pounds Min.	Newton Meter
-01	.062	.125	15	1.73
-02	.125	.250	20	2.30
-03	.250	.375	30	3.45
-04	.375	.500	35	4.03
-05	.500	.625	40	4.60
-06	.625	.750	45	5.18
-07	.750	.875	50	5.75
-08	.875	1.000	55	6.33
-09	1.000	1.125	60	6.90
-10	1.125	1.250	65	7.48
-11	1.250	1.375	70	8.05
-12	1.375	1.500	75	8.62
-13	1.500	1.625	75	8.62
-14	1.625	1.750	75	8.62
-15	1.750	1.875	75	8.62
-16	1.875	2.000	75	8.62

4. Disassemble the connector and slide the components back over the cable as shown in Figure 11.

5. Crimp contacts onto the wires. Follow step-by-step instructions on pages 17 to 23.

6. Using the proper insertion tool (pages 32-33),* push contacts from rear of the insert into the proper cavity using a straight push until seated. For proper seating dimension See Table V page 11. Use isopropyl alcohol **only** as a lubricant.
**** Important: if installing size 12 or smaller female contacts, guide pins should be used to ease entry and prevent shaving of the insert retention shoulders. (See Figure 7, Page 12).***

7. Place flat washer and wave washer into the coupling nut and then slide forward over the plugshell.
Note: Wave washer split must bear against the flat washer.

8. Couple plug onto a mating receptacle shell or dummy receptacle. Clamp the receptacle horizontally in a vise.

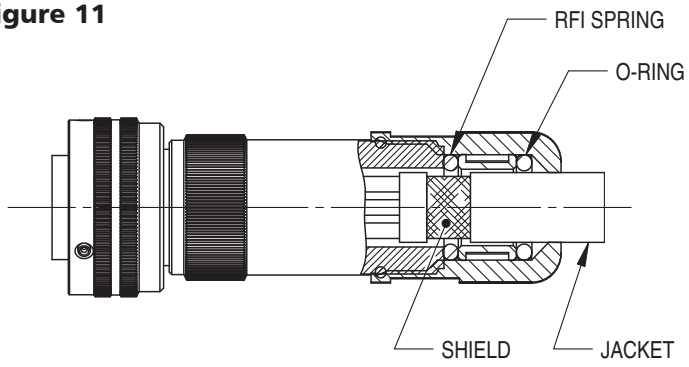
9. Insure that backshell O-Ring (if supplied) is installed into its internal groove.

10. Slide the backshell forward and screw it onto the rear of the plugshell. Proper torque values are shown in Table VI, page 12. The shield window will be in the area of the base of the 45 degree angle chamfer at the rear of the backshell, as shown in Figure 11.

11. Slide the backnut assembly forward. Screw it onto the backshell using the torque values listed in table VI A.

12. Perform a continuity check to ensure all wires on the cable are terminated properly and that the shield is electrically connected to the backshell. Assembled view is shown in Figure 11.

Figure 11



Style SB Termination

This style SB termination method uses a backshell with a screw-on backnut to capture the braid thereby mechanically and electrically terminating it to the backshell. Because there is no sealing provision for jacketed cable with this design, for environment protection, a knurl on the backnut and a rib on the backshell provide retention for a heat shrink.

Figure 12a

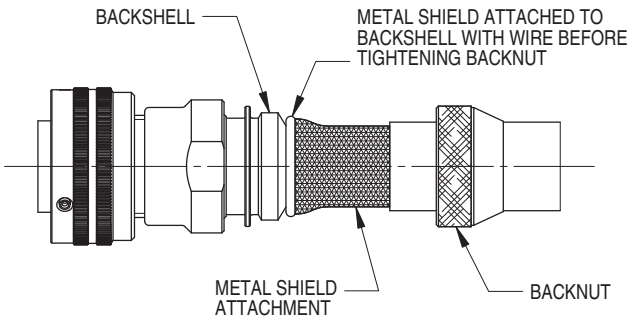
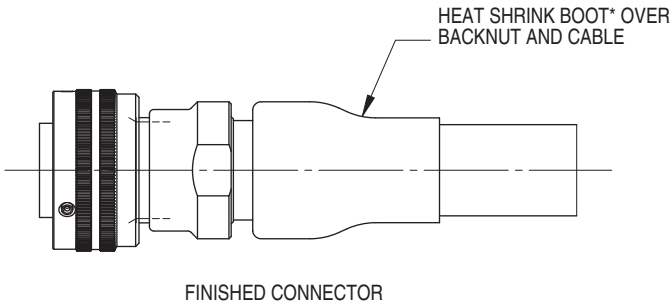


Figure 12b



* - Consult VEAM Customer Service for Heat Shrink Boots.

1. Strip back outer jacket and remove any filler material. Nicks are not permissible on the conductor insulation. Use Table VII to determine the proper strip length.

Figure 13

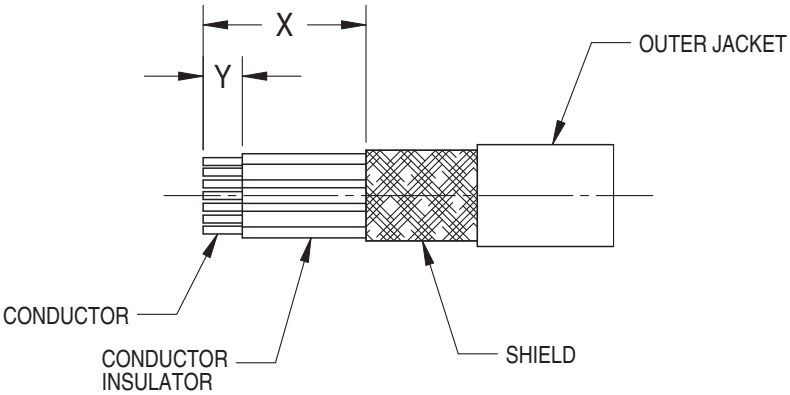


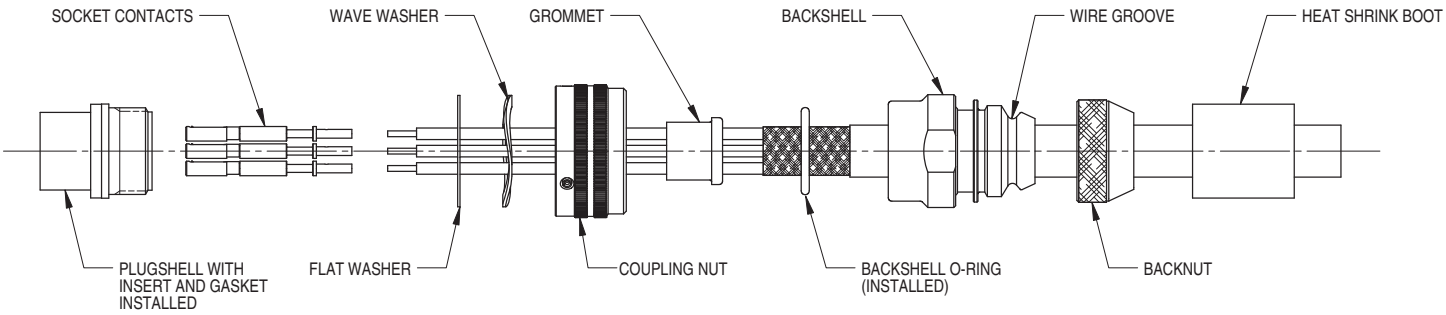
Table VII

Size	X	Y
10SL	53	23
14S	53	23
16	53	24.5
16S	68	28.5
18	68	28.5
20	75	28.5
22	75	28.5
24	75	28.5
28	75	28.5
32	75	28.5
36	75	28.5
40	75	28.5

Dimensions are in mm.

2, Slide connector components back over the cable as shown in Figure 14.

Figure 14



3. Strip the individual wires according to Table IV page 9.

4. Crimp the contacts onto the wires following the step-by-step instructions on pages 17-23.

5. Using the proper insertion tool (refer to pages 32-33),* push contacts into the proper cavity with a straight push until seated. Check proper seating dimension per Table V, page 11. Use isopropyl alcohol **only** as a lubricant.
**** Important: if installing size 12 or smaller female contacts, guide pins should be used to ease entry and prevent shaving of the insert (See Figure 7, Page 12). Use the extraction tool to reposition the contact if inserted too deeply.***

6. Place flat washer and wave washer into the coupling nut and then slide forward over the plugshell.
Note: Wave washer split must bear against the flat washer.

7. Couple plug onto a mating receptacle shell or dummy receptacle. Clamp the receptacle horizontally in a vise.

8. Push the grommet forward over cable and bring to bear against back of insert in plugshell.
Important: A separate compression ring is not required with the SB style backshell. Compression ring geometry is duplicated within the backshell body.

9. Slide the backshell forward. Tighten it onto the rear of the plugshell using an adjustable wrench.

10. Pull the metal shield up over the wire groove in rear of backshell. Bring to bear against back of threads. Do not cover threads with the metal shield. See Figure 12A, page 15.

11. Wrap a precut length of steel wire completely around portion of metal shield that is positioned over wire groove in the backshell. Using pliers, twist ends of wire together until the shield is securely held inside the groove. Trim off any excess wire or shield braid.

12. Slide the backnut forward over the cable. Tighten securely to the backshell, using a strap wrench.

13. Slide a heat shrink boot up over the rear of the connector until it covers the backnut and metal cable shield. Cover completely.

14. Shrink the boot with a heat gun. After the shrink boot cools, check to make sure the backnut and metal shield are sealed. See Figure 12B, page 15.

15. Perform a continuity check on wiring and verify proper assembly per the schematic.

Table VIII

Contact Size	Wire Size AWG	VEAM Contact Number	AF8 or M22520/1-01 Hand Tools			Model 400 BHD Pneumatic		Model 500 D Pneumatic	
			Turret	Setting	Color	Die Part No.	Locator Part No.	Die Part No.	Locator Part No.
20P	20	46730-20P	616266	20/4	Red	·····	·····	·····	·····
20S	20	46731	616266	20/4	Green	·····	·····	·····	·····
18P	18	46740P	TH485	20/4	Yellow	·····	·····	·····	·····
18S	18	46740S	TH485	20/4	Red	·····	·····	·····	·····
18P	20-22	46740-15P	TH485	20/4	Yellow	·····	·····	·····	·····
18S	20-22	46740-15S	TH485	20/4	Red	·····	·····	·····	·····
18P	16	46740-22P	TH485	16/6	Yellow	·····	·····	·····	·····
18S	16	46740-22S	TH485	16/6	Red	·····	·····	·····	·····
16S P	16	27911	616266	16/6	Red	414DA-16N	4314-2	·····	·····
16S S	16	27961	616266	16/6	Red	414DA-16N	4314-1	·····	·····
16S P	20-24	27911-13	616266	20/4	Red	·····	·····	·····	·····
16S S	20-24	27961-13	616266	20/4	Red	·····	·····	·····	·····
16S P	20	27911-15	616266	18/5	Red	414DA-16N	4314-2	·····	·····
16S S	20	27961-15	616266	18/5	Red	414DA-16N	4314-1	·····	·····
16S P	14-16	27911-20	616266	16/6	Red	414DA-12N or 16N	4314-2	·····	·····
16S S	14-16	27961-20	616266	16/6	Red	414DA-12N or 16N	4314-1	·····	·····
16S P	12-14	27911-26	616266	12/8	Red	414DA-12N	4314-1	·····	·····
16S S	12-14	27961-26	616266	12/8	Green	414DA-12N	4314-2	·····	·····
16 P	16	27913	616266	16/6	Blue	414DA-16N	4332	·····	·····
16 S	16	27963	616266	16/6	Green	414DA-16N	4332	·····	·····
16 P	24-26	27913-08	616266	20/4	Blue	·····	·····	·····	·····
16 S	24-26	27963-08	616266	20/4	Green	·····	·····	·····	·····
16 P	20-22	27913-12	616266	20/4	Blue	·····	·····	·····	·····
16 S	20-22	27963-12	616266	20/4	Green	·····	·····	·····	·····
16 P	20-24	27913-13	616266	20/4	Blue	·····	·····	·····	·····
16 S	20-24	27963-13	616266	20/4	Green	·····	·····	·····	·····
16 P	18-20	27913-15	616266	20/5	Blue	414DA-16N	4332	·····	·····
16 S	18-20	27963-15	616266	20/5	Green	414DA-16N	4333	·····	·····
16 P	14-16	27913-20	616266	16/6	Blue	414DA-12N or 16N	4332	·····	·····
16 S	14-16	27963-20	616266	14/7	Green	414DA-12N or 16N	4333	·····	·····
16 P	12-14	27913-26	616266	12/8	Blue	414DA-12N	4332	·····	·····
16 S	12-14	27963-26	616266	12/8	Green	414DA-12N	4333	·····	·····
12 P	8	27914-8	·····	·····	·····	414DA-8HEX or 8N	4330M	·····	·····
12 S	8	27964-8	·····	·····	·····	414DA-8HEX or 8N	4331M	·····	·····
12 P	20-22	27914-12	616266	20/4	Green	·····	·····	·····	·····
12 S	20-22	27964-12	616266	20/4	Green	·····	·····	·····	·····
12 P	14-18	27914-20	616266	12/8	Green	414DA-10N	4330	·····	·····
12 S	14-18	27964-20	616266	12/8	Green	414DA-10N	4331	·····	·····
12 P	2.5mm^2	27914-22	616266	12/8	Green	414DA-10N	4330	·····	·····
12 S	2.5mm^2	27964-22	616266	12/8	Green	414DA-10N	4331	·····	·····
12 P	12	27914-26	616266	12/8	Green	414DA-12N or 10N	4330	·····	·····
12 S	12	27964-26	616266	12/8	Green	414DA-12N or 10N	4331	·····	·····
12 P	4mm^2	27914-30	·····	·····	·····	414DA-10N	4330	·····	·····
12 S	4mm^2	27964-30	·····	·····	·····	414DA-10N	4331	·····	·····
12 P	10	27914-38	·····	·····	·····	414DA-10N	4330	·····	·····
12 S	10	27964-38	·····	·····	·····	414DA-10N	4331	·····	·····

Table VIII

Contact Size	*Wire Size AWG*	*VEAM Contact Number*	*AFB Hand Tool*	*Model 400 BHD Pneumatic*		*Pneumatic Model 500 D*	
			Turret	Die Part Number	Locator Part Number	Die Part Number	Locator Part Number
8P	4 mm sq	27915-30	---	414DA-10N	4329	---	---
8S	4 mm sq	27935-30	---	414DA-10N	4329	---	---
8P	10	27915-38	---	414DA-10N	4329	---	---
8S	10	27935-38	---	414DA-10N	4329	---	---
8P	6	27915-58	---	414DA-8 HEX	4329	514DA-8 HEX	5497
8S	6	27935-58	---	414DA-8 HEX	4329	514DA-8 HEX	5497
8P	8	27915	---	414DA-8 HEX OR 8N	4329	514DA-8 HEX	5404
8S	8	27935	---	414DA-8 HEX OR 8N	4329	514DA-8 HEX	5404
8P	12-14	27915-26-62	---	414DA-8N	4329	514DA-8 HEX	5404
8S	12-14	27935-26-62	---	414DA-8N	4329	514DA-8 HEX	5404
8P	12-14	27915-26	---	414DA-10N	4329	---	---
8S	12-14	27935-26	---	414DA-10N	4329	---	---
4P	4 AWG 6 AWG	27916	---	414DA-4 HEX 414DA-8N or 8 HEX	4043	514DA-4 HEX 514DA-8N or HEX	5497
4S	4 AWG 6 AWG	27936	---	414DA-4 HEX 414DA-8N or 8 HEX	4043	514DA-4 HEX 514DA-8N or HEX	5497
4P	2.5 mm sq.	27916-22	---	414DA-12N	4043	---	---
4S	2.5 mm sq.	27936-22	---	414DA-12N	4043	---	---
4P	16 mm sq	27916-62	---	414DA-4 HEX	4043	514DA-4 HEX	5497
4S	16 mm sq	27936-62	---	414DA-A HEX	4043	514DA-4 HEX	5497
0P	0	27917V	---	---	---	---	---
0S	0	27937V	---	---	---	514DA-0 HEX	5441
0P	8	27917-45	---	---	---	514DA-0/8 HEX	5442
0S	8	27937-45	---	---	---	514DA-0/8 HEX	5441
0P	10 mm sq	27917-50	---	---	---	514DA-0/8 HEX	5442
0S	10 mm sq	27937-50	---	---	---	514DA-0/8 HEX	5441
0P	16 mm sq	27917-62	---	---	---	514DA-4 HEX	5442
0S	16 mm sq	27937-62	---	---	---	514DA-4 HEX	5441
0P	25 mm sq	27917-78	---	---	---	514DA-4 HEX	5442
0S	25 mm sq	27937-78	---	---	---	514DA-4 HEX	8002
0P	35 mm sq	27917-90	---	---	---	514DA-0 HEX	5442
0S	35 mm sq	27937-90	---	---	---	514DA-4 HEX	5442
0P	50 mm sq	27917-107	---	---	---	514DA-4 HEX	5442
0S	50 mm sq	27937-107	---	---	---	514DA-0 HEX	5441
0P	4	46646-0	---	---	---	514DA-4 HEX	5441-F
0S	4	4764-0	---	---	---	514DA-4 HEX	5441-F
4/0 P	2	47107-90	--	---	---	514DA-0 HEX	5498-1
4/0 S	2	47114-90	---	---	---	514DA-0 HEX	5498-2
4/0 P	0 (1/0)	47107-115	---	---	---	514DA-0 HEX	5498-1
4/0 S	0 (1/0)	47114-115	---	---	---	514DA-0 HEX	5498-2
4/0 P	2/0	47107-135	---	---	---	514DA-2/0 HEX	5498-1
4/0 S	2/0	47114-135	---	---	---	514DA-2/0 HEX	5498-1
4/0 P	70 mm sq	47107-144	---	---	---	514DA-4/0 HEX	5487
4/0 S	70 mm sq	47114-144	---	---	---	514DA-4/0 HEX	5487
4/0 P	95 mm sq	47107-165	---	---	---	514DA-4/0 HEX	5487
4/0 S	95 mm sq	47114-165	---	---	---	514DA-4/0 HEX	5487
4/0 P	4/0	47107-165	---	---	---	514DA-4/0 HEX	5487
4/0 S	4/0	47114-165	---	---	---	514DA-4/0 HEX	5487

* TH378 & TH379 mavbe combined into one turrent under P/N 616266

1. Select the proper crimp tool and contact locator for the contact used from Table VIII. Contacts Size 8 and larger require a pneumatic crimper (See Page 22).

2. Install the proper turret or contact positioner onto the crimp tool frame. Per Table VIII.

3. Check crimp tool calibration with a Go No-Go gauge (refer to page 21 for AF8 calibration). Go No-Go inspection gauges are available- consult factory.

4. Set the tool for the contact being crimped as per Table VIII, page 17.

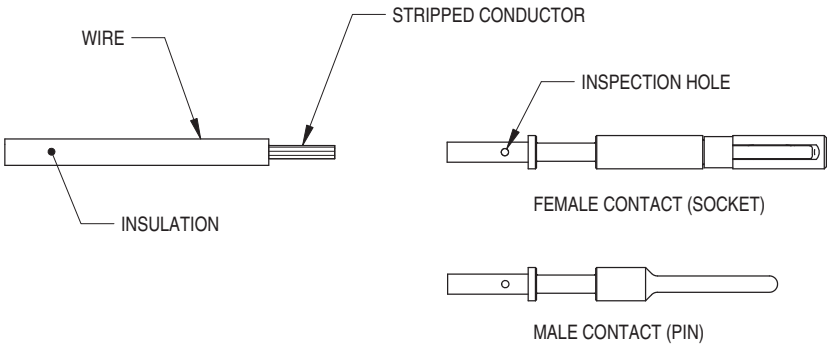
5. Insert stripped wire into the contact wire bucket.

6. Check inspection hole to see if the wire strands are evident. If you cannot see them, conductor strip length is too short. See Figure 15

Table IX

Crimp Retention Forces Per MIL-C-39029B		
Wire Sizes	**Silver or Tin-Plated Copper Wire Pounds Minimum**	**Nickel Plated Copper Wire Pounds Minimum**
20	20	19
16	50	37
14	70	60
12	110	100
10	150	135
8	220	200
6	300	270
4	400	360
0	700	630
4/0	875	785

Figure 15

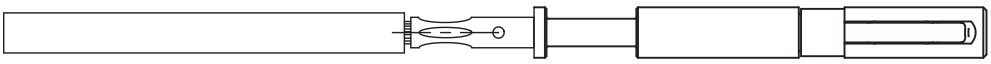


7. Insert the contact with the wire installed into the contact locating hole in the crimp tool positioner until it "bottoms" in the locating hole.

8. Activate crimp tool through one complete cycle.
Important: Tool ratchet action will not allow the contact to be removed in mid cycle.

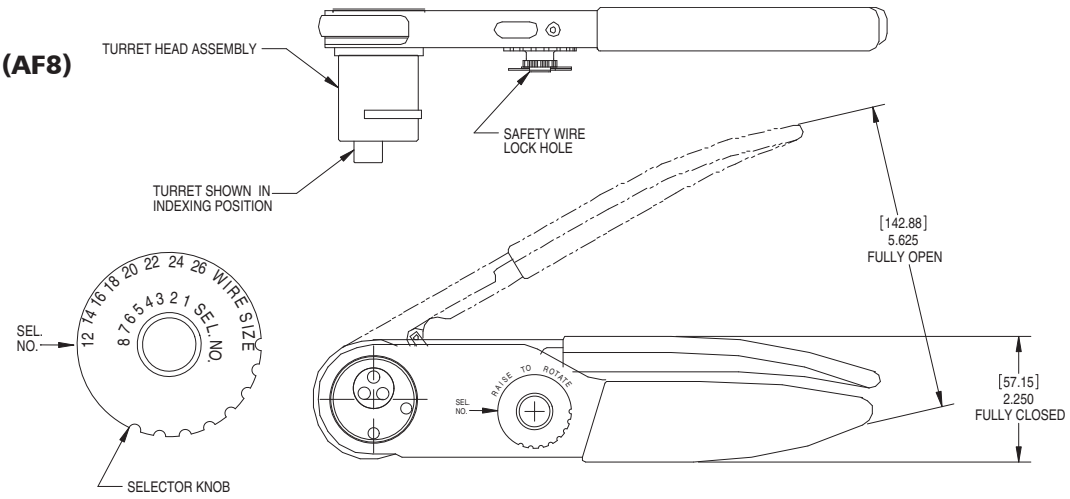
9. Examine the crimp joint for proper crimp location (see Figure 16). Loose wire strands or cracks in the contact crimp area must not be allowed. Proper crimp retention forces are detailed in Table IX.

Figure 16



Crimping Tools - Set up and Calibration

Figure 17
Crimp Tool (AF8)



Crimp Tool Set Up - AF8 or M22520/1-01

1.Select proper turret from Table VIII, Page 17 and install it onto the AF8 crimp tool frame with the hex wrench supplied with the tool (9/64 hex).

Changing Turret Head

All turrets are attached by means of two socket head screws.

Press the trigger which releases the Turret to the indexing position.

With screws lined up with the tapped holes, place the selected Turret Head Assembly onto the retainer ring.

After the Turret Head Assembly is seated against the ring, tighten the socket head screws with a 9/64 inch Allen Wrench. Turret should index easily without binding.

To remove, loosen socket head screws until the threads are disengaged from the retainer ring and remove with a straight lifting motion.

Using Indentor Closure Selector

Refer to data plate on Turret Head Assembly and Table VIII, page 17 for wire and contact size (Figure 19a).

Remove the spring clip lock from selector knob.

The tool must be in the open position when using selector.

Raise selector knob and rotate to desired selector setting (Refer to Table VIII, page 17). Replace the spring clip. The tools is ready for use. Repeat the instruction procedure when changing contact and/or wire sizes.

Figure 18

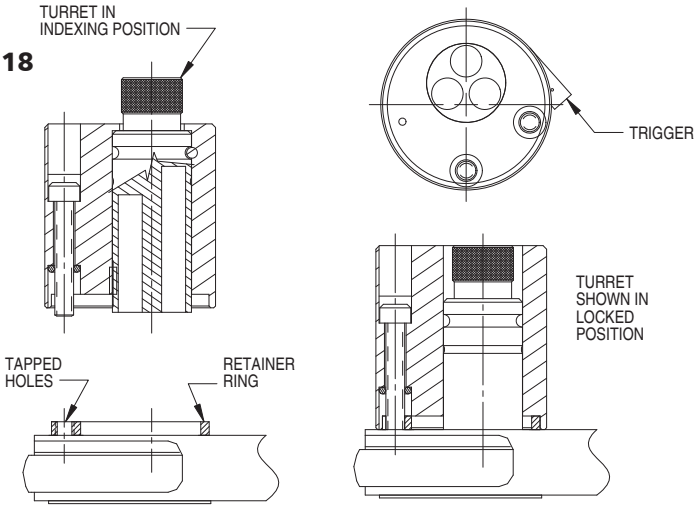


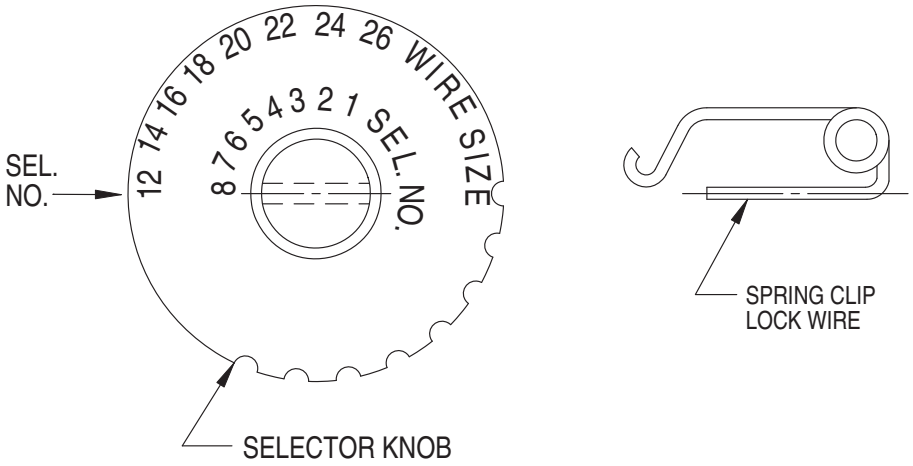
Figure 19a

Typical Data Plate

CONTACT	COLOR CODE	26	24	22	20	18	16	14	12	WIRE SIZE
-20	RED	1	2	3	4					SEL. No.
-16	BLUE				4	5	6			
-12	GREEN							7	8	

2. Adjust the indentor closure selector per Figure 19b.

Figure 19b



3. Index the turret head assembly for the proper contact per Figure 20.

Indexing Turret Head

Assemblies:

Press trigger to release the Turret to the indexing position.

Select the setting desired according to color coded data plate on Turret Head Assembly (Figure 19a) and Turret setting chart, page 17.

Index the Turret until the color coded positioner is lined up with the index mark on the Turret Head Assembly. The trigger will position the Turret.

Press the positioner until it snaps into locked position.

Figure 20

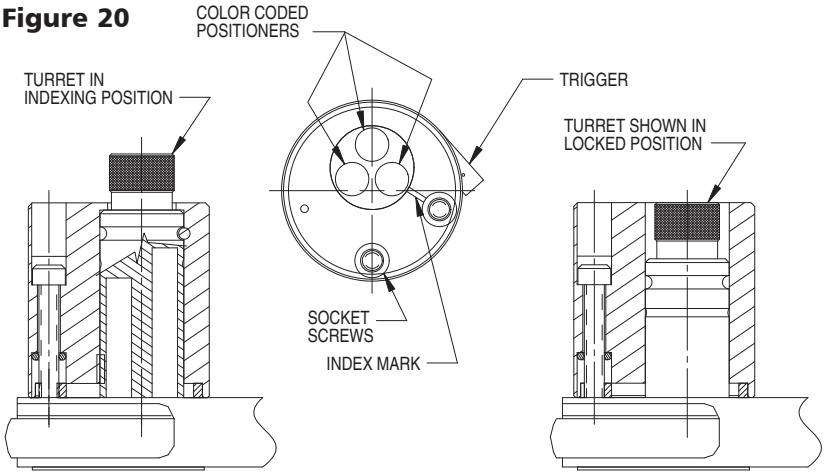
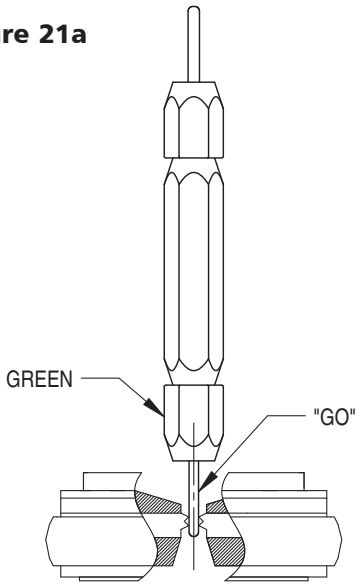


Figure 21a



You are now ready to check calibration and crimp wire into the contact.

Crimping Tools and Calibration - AF8

1. Set the selector knob to position No. 4 (whether the turret is installed or not is immaterial).

2. Move the handles to the fully closed position.

3. Insert the "Go" gauge (G125) as shown in Figure 21a. The gauge must pass freely between the indentor tips. Remove the gauge.

4. Insert the "No-Go" gauge shown in Figure 21b. The gauge must not enter between the indentor tips.

Caution: Do not crimp the gauge.

Figure 21b

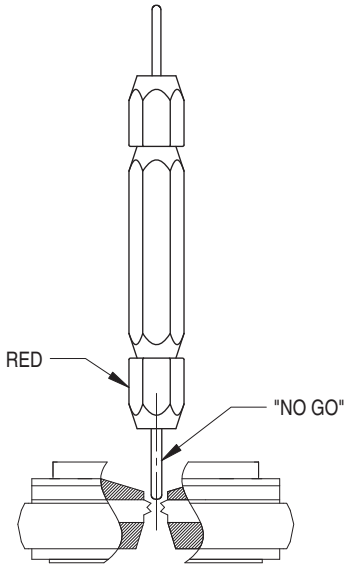
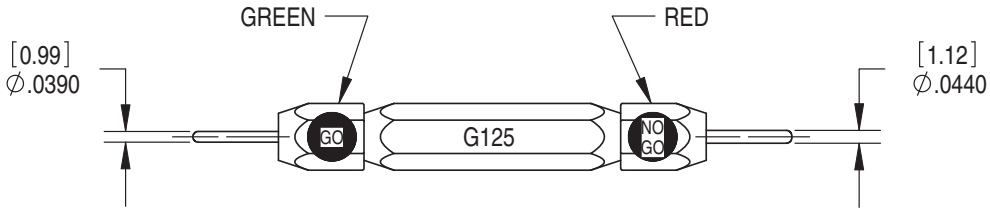


Figure 21c



Pneumatic Crimp Tool Set Up - Model 400BHD and Model 500

Model 400 BHD and 500 crimp tools are precision, pneumatic, full cycling tools. They are capable of producing four-indent crimps on pin and socket type contacts size 12 through 300 MCM, hex crimps on pin and socket type contacts size 0, 4, and 8, and two-indent crimps on terminals, splices or pigtails, insulated or non-insulated through wire sizes 26-300 MCM. Flexibility is achieved by simply changing heads and locators in accord with factory directions. Either tool is usable as a portable hand tool, a bench-mounted hand controlled tool, or as a foot controlled unit. They are designed and tested to operate on a supply of clean dry air or inert gas within a pressure range of 90 to 125 PSI (maximum) depending on the size of contacts or terminals to be installed. ***Installation must include a good regulator with filter installed within 25 feet of the tool.***

The air inlet port is tapped to accommodate 1/4 NPT fittings. You may use direct pipe thread fittings or quick disconnect. To avoid leakage or damage to the threads, always use a non-setting pipe thread compound or soft grease when installing connections. Connection should be tight enough to prevent leakage.

Be sure that proper location and die assembly head are installed before turning on air supply.

Installation of Location and Die Assembly Head

1. The Locator must be seated in counterbore flush with retainer face. The Locator number should be visible. The Die Assembly must locate on the index pin and sit flat on the retainer face. The nut must be securely screwed down on the barrel (use spacer if provided).

Refer to Crimping Tool Selector on page 17.

2. Turn air on. Adjust to approximately 100 PSI. Operate the trigger without a contact and wire in place. Observe the action of the indentors to be sure they operate freely.

Gaging: Four-Indent and Hex Crimp Die Assemblies

All pin/socket crimp die assemblies are clearly marked at the factory with the "Closed Diameter" of the indentors, and may be gaged with check pins, .005 under marked diameter for "Go" and .002 over marked diameter for "No-Go."

After observing the free action of indentors, hold the trigger or foot control in the "On" position and check with the proper size gage or pin. The "Go" gage shall enter freely. The "No-Go" gage should not enter.
Caution: Do not crimp against gage! To do so will injure the tool and void your warranty.

Gaging: Terminal Die Assemblies

All terminal crimp die assemblies are clearly marked at the factory with the "Gaging diameter" of the indentors and may be gaged with check pin, .005 under marked diameter for "Go" and .002 over marked diameter for "No-Go."

After observing the free action of indentors, hold the trigger or foot control in the "On" position and check with the proper size gage or pin. The "Go" gage shall enter freely. The "No-Go" gage shall not enter.
Caution: Do not crimp against gage! To do so will injure the tool and void your warranty.

3. Insert the contact or terminal and wire assembly and proceed to crimp. Test a few crimped samples every day to be sure all quality requirements are within the limits of the applicable MIL specification.

Cycling Mechanisms

To check proper operation of the cycling mechanism, reduce the line pressure to the minimum necessary to operate the tool without a contact and wire assembly in position (usually about 20 to 25 PSI).
Insert contact and wire assembly into position.

Activate the trigger or foot control. The indentors should lock on the contact and wire assembly and shall not release until the air supply is either increased to the normal operating range, (tool completes cycle); or, is completely disconnected from the air supply.

This check should be made once per week; or, after every 10,000 crimps, whichever occurs first. Tests should be under the direction of responsible personnel from Quality Control or Plant Supervisor.

To use as a foot controlled unit:

a. First, disconnect from the air supply.

b. Remove the 1/4 NPT socket head plug from the center of the rear casting. Re-install it in the rear of handle, using a non-setting pipe compound or soft grease.

c. In the center of the rear casting, install 1/4 NPT brass coupler bushing, or a quick disconnect fitting.

d. Connect the hose from the foot control pedal to the tool. Connect the air supply to the inlet port of the foot control.

e. You can now proceed as instructed in #1.

All parts of the Model 400 BHD and 500 are precision made from the finest materials, designed to give long satisfactory service. All are warranted to be free from manufacturing or material defects for one (1) year.

To be sure that you obtain peak performance, we recommend that your tool be returned to the factory at least once per year for the regular overhaul and test. Service can be completed normally within five (5) days at a moderate cost. If the preceding instructions are carefully followed and the tool is not abused, you can count on many years of reliable, trouble-free performance.
Caution: Do not attempt to disassemble power unit, trigger handle, or foot control unit, at any time. To do so will void your warranty.

Soldering Electrical Contacts

As soldering is a known art and an acquired skill, we will not attempt a tutorial on the proper procedure in this manual. Explicit instructions are available from the VEAM Customer Service Department upon request.

It is necessary, however, to point out the following Do's and Don'ts:

Do:	Don't:
Use rosin core flux	Use acid core flux
Use a solder iron sized for the job	Use a too hot iron or torch
Allow the solder to flow properly	Cool the soldered joint rapidly
Clean the soldered joints	Create "solder bridges"
Inspect each soldered joint	Burn the insulators with prolonged heat

Solder and solder aids (tools, flux, instructions, etc.) are available from:
Kester Inc.
800 West Thorndale Ave.
Itasca, IL 60143
1-800-253-7837
www.kester.com

TENSILE STRENGTH AND MILLIVOLT DROP MEASUREMENTS MEET THE REQUIREMENTS OF MIL- C-39029, MIL-C-22520, MIL-T-7928 AS APPLICABLE.

Pneumatic Power Crimping Tool Model 400B HD

This lightweight (16 lbs.) crimping tool will crimp pin and socket contacts as well as solderless terminals. Non-adjustable dies are available to accommodate wires ranging from 16AWG through 4AWG.The four-indent crimp jaws guarantee a perfect gas tight crimp every time, maximizing wire-contact pull-out forces. Locators are available for every CIR series contact.

The Model 400B HD Power Crimp Tool is excellent for high production runs of small gauge contacts.

Operating Air pressure: 100-120 PS Size: 4" O.D. x $12\frac{3}{4}$" Long
Bench mounting version is standard. Foot pedal # 104 available.
For large contacts and terminals use our Model 500D Tool.

This tool is available from Pico Corporation
Phone: (805) 388-5510
Fax: (805) 482-4038

Pneumatic Power Crimping Tool Model 500D

This power crimping tool will handle pin and socket contacts plus lug terminals (insulated or non-insulated) in all sizes ranging from 8AWG to 250 MCM.
Bench mounting version is standard. Foot pedal #105 available.

Consult our factory for foot pedal accessories.

Shipping weight: 45 lbs. approximate.

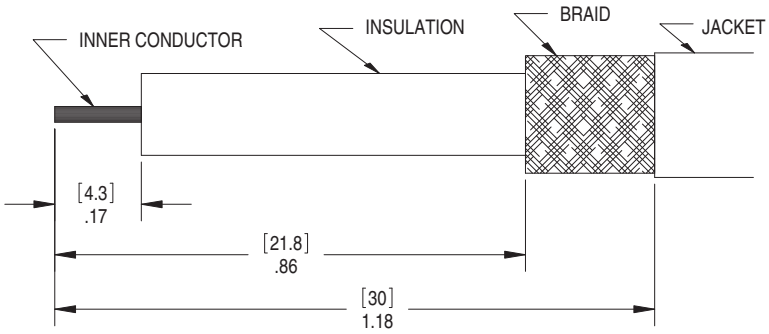
Operating Air pressure: 100-120 PSI.

This tool is available from Pico Corporation
Phone: (805) 388-5510
Fax: (805) 482-4038

Assembly Procedure for F80 Style Coaxial Contacts (Size 8)

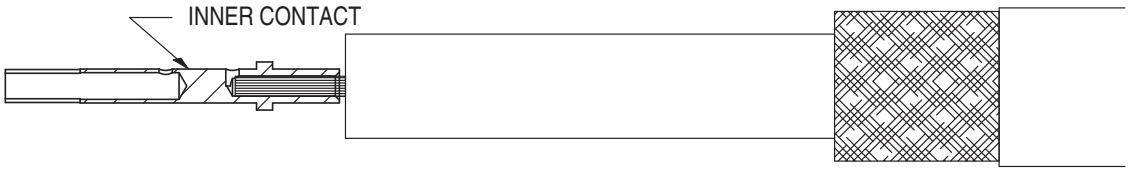
1. Cut the end of the cable squarely, do not crush.

2. Strip the outer jacket, trim the braid and strip the inner conductor insulation as shown below. Use care not to nick braid or inner conductor.

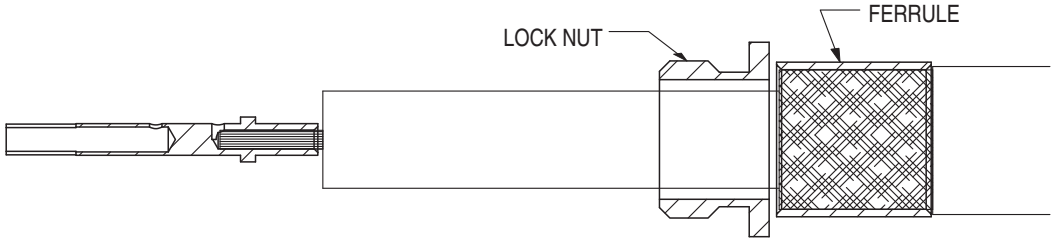


3. Assemble components in following order:

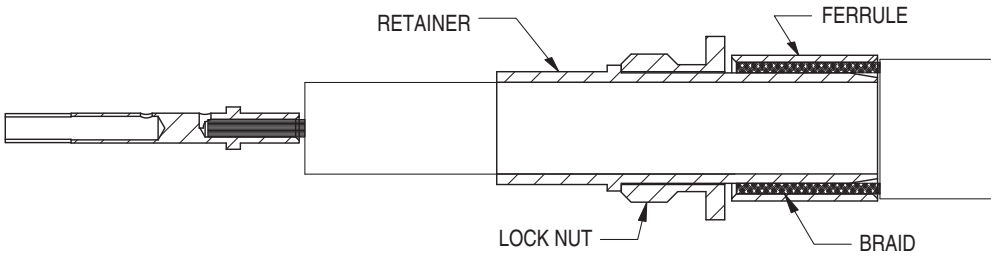
a. Solder the inner contact to the inner conductor.



b. Slide crimp ferrule over the braid and the locknut over the insulation.

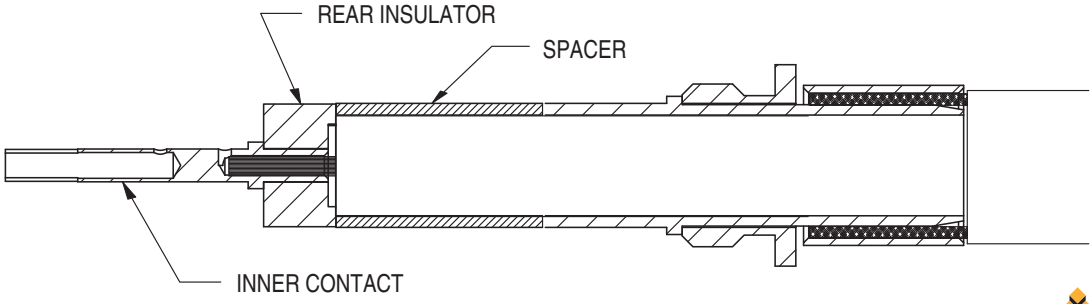


c. Install the retainer (tapered end first) over the insulation so that the retainer slides under the locknut and under the braid until it butts against the jacket. The braid will be sandwiched between the retainer and the crimp ferrule.

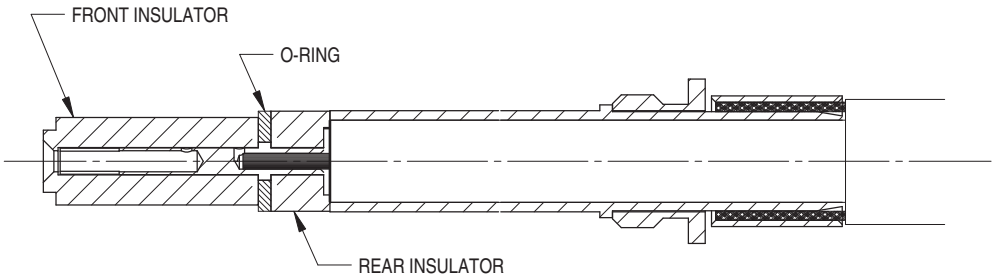


d. Slide the metal spacer over the inner insulation against the retainer.

e. Assemble the rear teflon insulator over the inner contact (the insulator is split) against the spacer, with the flat surface facing front.



f. Assemble the O-ring over the inner contact up to the rear insulator. Slide the front teflon insulator over the inner contact with the flat surface facing the O-ring.



g. Position the crimp ferrule against the locknut and crimp the braid and retainer together using the crimp tool per Table X. Slide the assembled components into the outer contact body, which has been previously installed into the insert at the factory and tighten the lock nut,

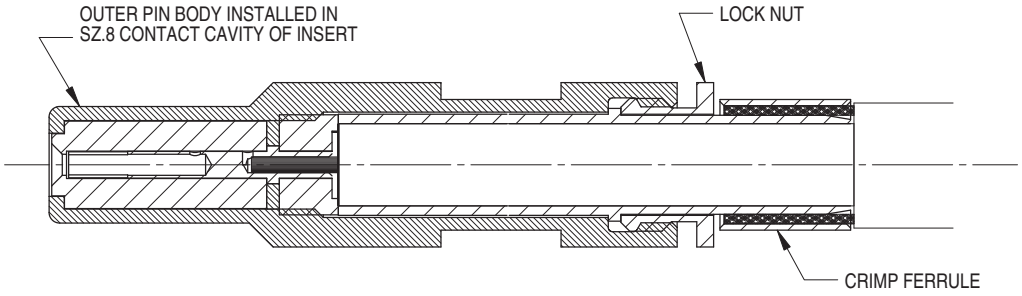


Table X

CRIMP TOOLS FOR COAXIAL CONTACTS				
Contact Part Number				
Pin	Socket	Cable	Crimp Tool	Crimp Die
C8-058P	C8-058S	RG 58	M22520/5-01	M22520/5-05
C8-062P	C8-062S	RG 59 & RG 62	M22520/5-01	M22520/5-05
C8-142P	C8-142S	RG 142	M22520/5-01	M22520/5-05
C8-174P	C8-174S	RG 174 & RG 188	M22520/5-01	M22520/5-06
C8-179P	C8-179S	RG 179	M22520/5-01	M22520/5-06
C8-180P	C8-180S	RG 180	M22520/5-01	M22520/5-05
C8-400P	C8-400S	RG 400	M22520/5-01	M22520/5-05

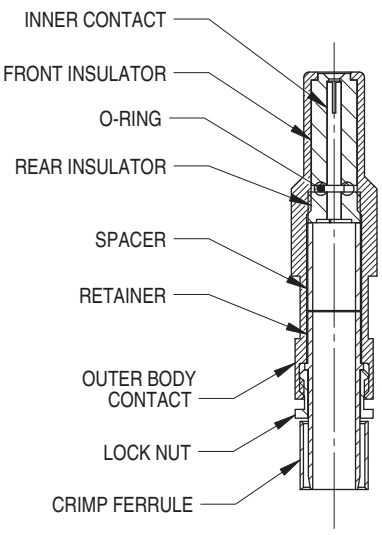


Figure 25 - PIN CONTACT

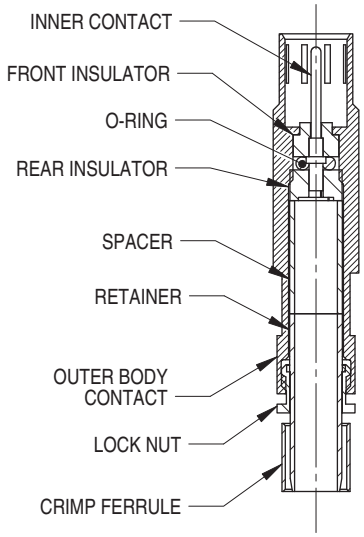


Figure 26 - SOCKET CONTACT