

SMB Connectors
NOTE


All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of ± 0.13 [± 0.005] and angles have a tolerance of $\pm 2^\circ$. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of SMB connectors. The connectors are available in 50-ohm and 75-ohm straight cable plug, 50-ohm straight cable jack, 50-ohm right-angle reverse polarity cable plug, and 50-ohm bulkhead jack for wire-to-wire applications. The bulkhead jack is designed to be panel mounted. The connectors consist of a body, contact, and ferrule. The body of the right-angle cable plug features an inner ferrule. The right-angle cable plug also includes an end cap to seal the solder slot of the body, and the bulkhead jack also includes a jam nut and lockwasher for mounting onto the panel.

NOTE


A housing and clip are available to be assembled onto the straight cable jack. The housing (assembles onto the jack body) provides an additional locking mechanism for the mating connector, and the clip (assembles onto the housing) is used to attach other cable for ease in routing assemblies.

When assembled, the contact and ferrule of the straight cable connector and bulkhead jack are crimped onto the cable. For the right-angle cable plug, the contact is soldered, and the ferrule is crimped onto the cable. These requirements are applicable to hand application tooling.

When corresponding with personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in Figure 1.

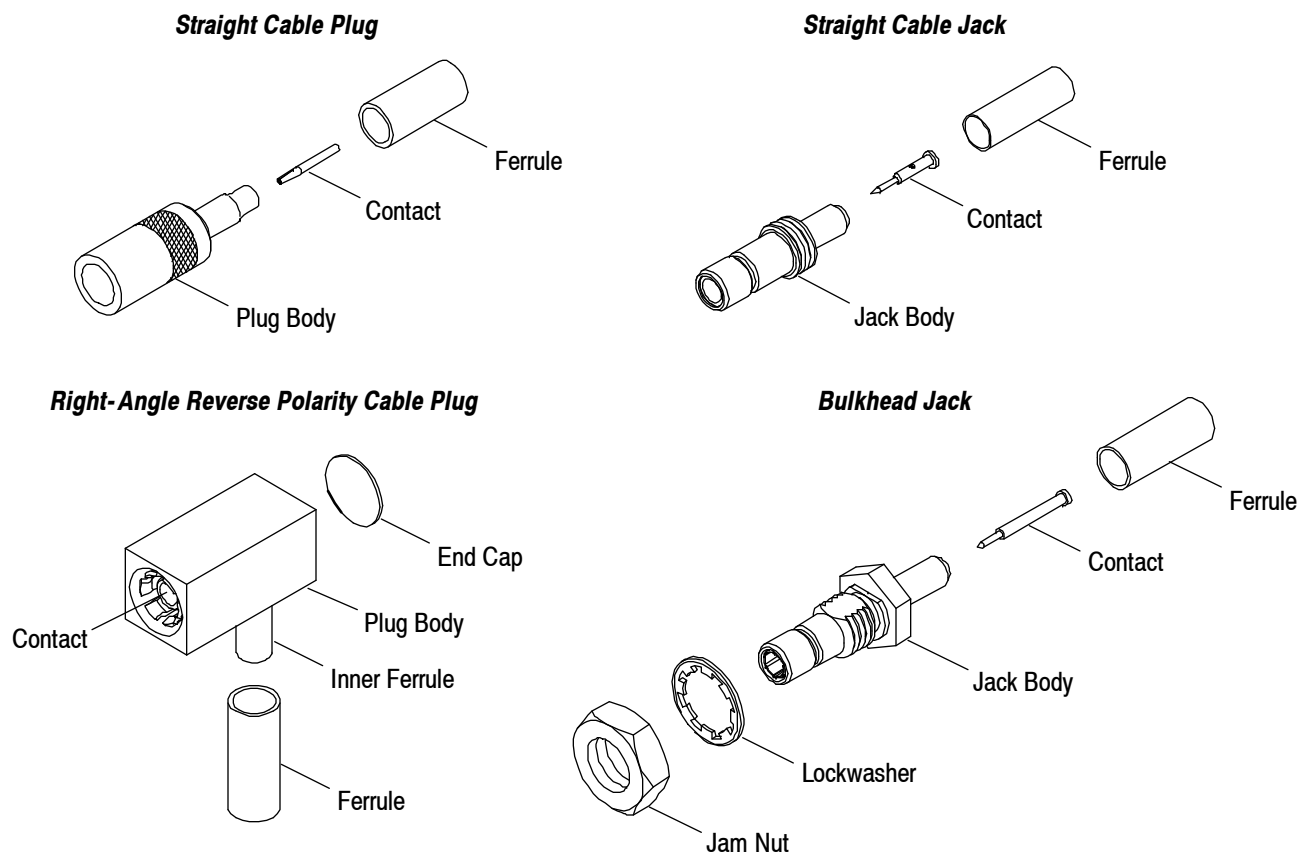


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this application specification include:

- Changed company name and logo
- Changed reference part number and product code in Paragraph 2.2

2.2. Customer Assistance

Reference Product Part Number 414946 and Product Code M264 are representative of SMB connectors. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through a local Representative or, after purchase, by calling PRODUCT INFORMATION at the number at the bottom of page 1.

2.3. Drawings

Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, call PRODUCT INFORMATION at the number at the bottom of page 1.

2.4. Manuals

Manual 402-40 can be used as a guide to soldering. This manual provides information on various flux types and characteristics with the commercial designation and flux removal procedures. A checklist is included in the manual as a guide for information on soldering problems.

2.5. Specifications

Product Specification 108-1401 provides product performance and test information.

2.6. Instructional Material

Instruction Sheets (408-series) provide product assembly instructions or tooling setup and operation procedures. Documents available which pertain to this product are:

408-2766	Coaxial Cable Stripper Kits 603995-[]
408-2987-12	SMB 50-Ohm and 75-Ohm Straight Cable Plug Connectors
408-8622	SMB 50-Ohm Straight Cable Jack Connector
408-8711	SMB Right-Angle Reverse Polarity Cable Plug Connector 1274039-1
408-8729	SMB 50-Ohm Bulkhead Jack Connector 1274387-1
408-9614	Flameless Heat Shrink Gun 600655-2
408-9830	PRO-CRIMPER* III Hand Tool Assembly 58499-1 with Die Assembly 58483-1
408-9930	PRO-CRIMPER III Hand Crimping Tool Frame Assembly 354940-1

3. REQUIREMENTS

3.1. Cable Selection and Preparation

The connectors will accept flexible coaxial cable sizes RG 174/U, 178/U, 188/U, 196/U, and 316/U; and 188/U and 316/U with double braid. Refer to the connector customer drawing for applicable cable sizes.

The cable must be prepared according to the following:

1. Heat shrink tubing is available for applications where strain relief is necessary due to high torque or severe or repeated flexing of the cable. If used, the heat shrink tubing must be assembled onto the cable before the ferrule.

NOTE

For availability of heat shrink tubing, call PRODUCT INFO at the number at the bottom of page 1.



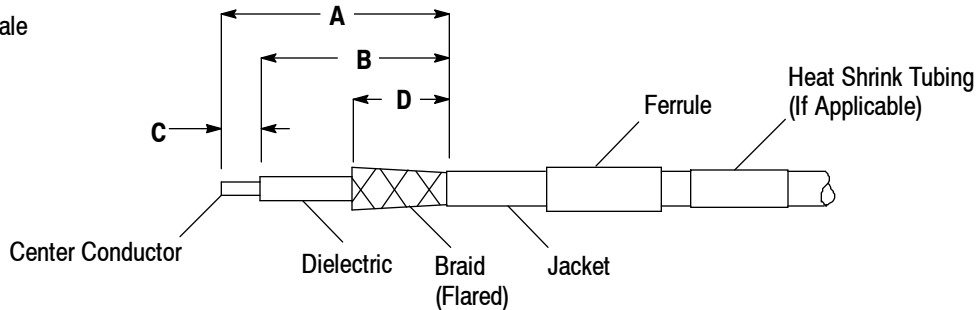
2. The ferrule must be installed onto the cable before stripping the cable.
3. Proper strip length is necessary to properly assemble the cable onto the contact. The strip length of the cable is shown in Figure 2.



Reasonable care must be taken not to nick, scrape, or cut any part of the cable during the stripping operation.

4. The braid must be flared after stripping the cable.

Note: Not to scale



CONNECTOR TYPE	CABLE STRIP LENGTH DIMENSION ± 0.25 [± 0.10]			
	A	B	C (Ref)	D
Straight Cable Plug	13.46 [.530]	10.21 [.402]	3.25 [.128]	6.35 [.250]
Straight Cable Jack	12.70 [.500]	10.16 [.400]	2.54 [.100]	7.11 [.280]
Right-Angle Reverse Polarity Cable Plug	10.70 [.421]	9.14 [.360]	1.60 [.063]	6.35 [.250]
Bulkhead Jack	12.06 [.475]	8.89 [.350]	3.18 [.125]	7.11 [.280]

Figure 2

3.2. Assembly

The connectors must be assembled according to the applicable instruction sheet.

A. Straight Cable Plug, Straight Cable Jack, and Bulkhead Jack

These connectors must conform to the requirements shown in Figure 3.

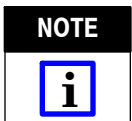
1. Contact Crimp

The contact must be crimped to the cable center conductor according to instructions packaged with applicable tooling. The crimp height must be within the dimensions provided in Figure 3.

The force applied during crimping may cause some bending between the contact and center conductor. Such deformation is acceptable where the crimped portion bends up and down or side to side within the limits shown in Figure 3.

2. Ferrule Crimp

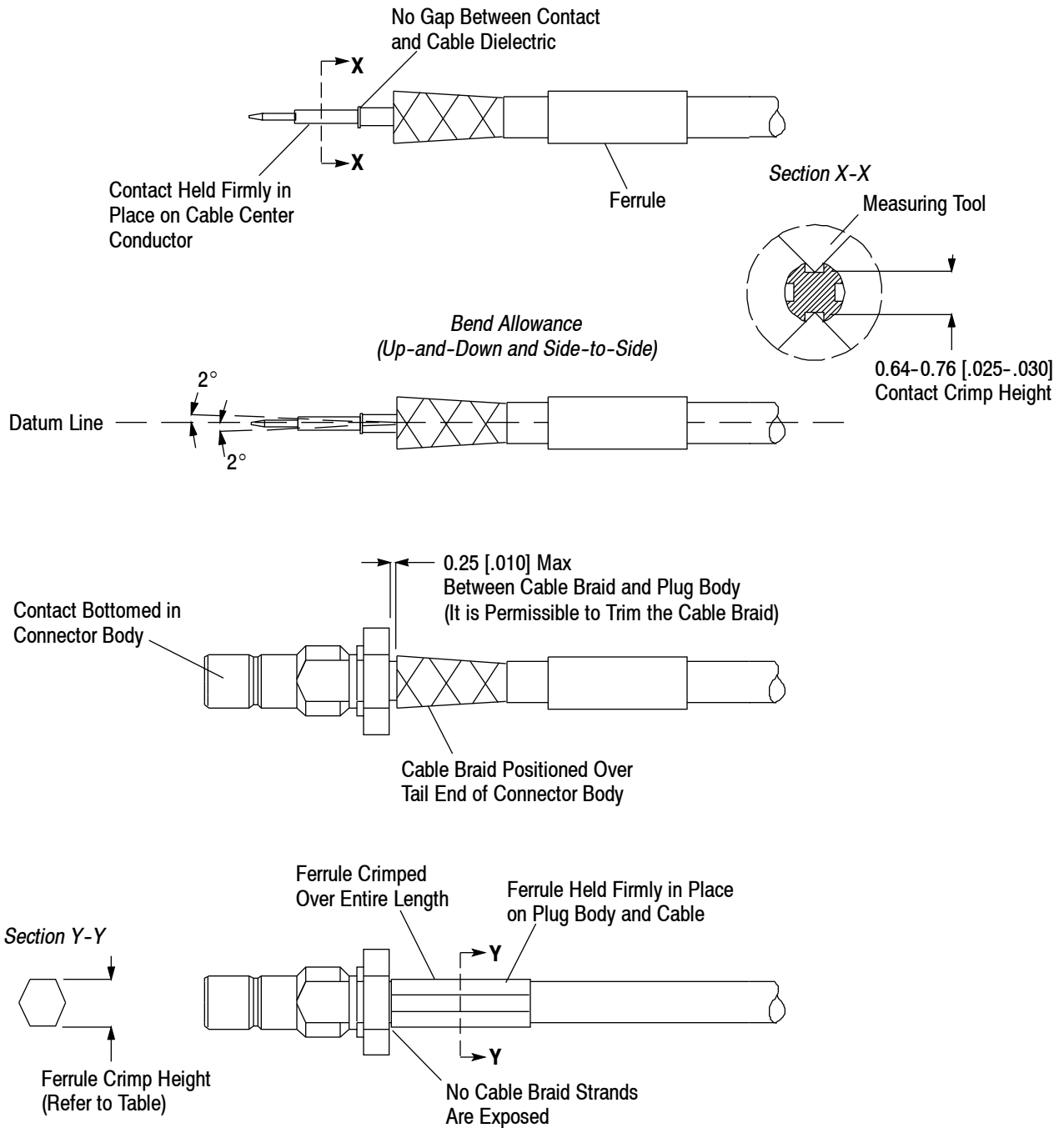
The ferrule must be crimped to the cable according to instructions packaged with applicable tooling. When measuring for ferrule crimp height, the ferrule must be measured across the flats of the hex crimp. The crimp height must be within the dimensions provided in Figure 3.



The developed crimp heights result from using the specific tooling described in Section 5, TOOLING.

Straight Cable Connectors and Bulkhead Jack

Note: Bulkhead jack shown, requirements apply equally to straight cable connectors.



CABLE SIZE (RG/U)	FERRULE CRIMP HEIGHT $+0.10/-0.05$ [$+.004/-0.002$]
161, 174, 179, 187, 188, 316	3.25 [.128]
178, 196	2.67 [.105]
174, 188, 316 (All Double Braid)	3.84 [.151]

Figure 3

B. Right-Angle Reverse Polarity Cable Plug

1. Soldering the Contact

Guidelines and procedures must be observed when soldering contacts. Solder, clean, and dry the contact according to the following:

— Flux Selection

The contact must be fluxed prior to soldering with a mildly active, rosin base flux. Flux must be compatible with manufacturing, health, and safety requirements. Call PRODUCT INFORMATION at the number at the bottom of page 1 for consideration of other types of flux. Flux that is compatible with these connectors are provided in Figure 4.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER	ALPHA
RMA	Mild	Noncorrosive	186	611

Figure 4

— Cleaning

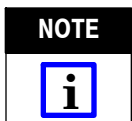
After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. Common cleaning solvents that will not affect the cable plug for the time and temperature specified are listed in Figure 5.

CLEANER		TIME (Minutes)	TEMPERATURE (Maximum)
NAME	TYPE		
ALPHA 2110	Aqueous	1	132°C [270°F]
BIOACT EC-7	Solvent	5	100°C [212°F]
Butyl CARBITOL Solvent	Solvent	1	Ambient Room
Isopropyl Alcohol	Solvent	5	100°C [212°F]
KESTER 5778	Aqueous		
KESTER 5779	Aqueous		
LONCOTERGE 520	Aqueous		
LONCOTERGE 530	Aqueous		
Terpene Solvent	Solvent		

Figure 5



Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the manufacturer's Material Safety Data Sheet (MSDS) for characteristics and handling of cleaners. Trichloroethylene and Methylene Chloride is not recommended because of harmful occupational and environmental effects. Both are carcinogenic (cancer-causing).



If there is a particular solvent that is not listed, contact PRODUCT INFORMATION at the number at the bottom of page 1.

— Drying

When drying cleaned assemblies, make certain that temperature limitations are not exceeded: -20° to 105°C [-4° to 221°F]. Excessive temperatures may cause degradation.

2. Ferrule Crimp

The ferrule must be crimped to the cable according to instructions packaged with applicable tooling. When measuring for ferrule crimp height, the ferrule must be measured across the flats of the hex crimp. The crimp height must be within the dimensions provided in Figure 6.

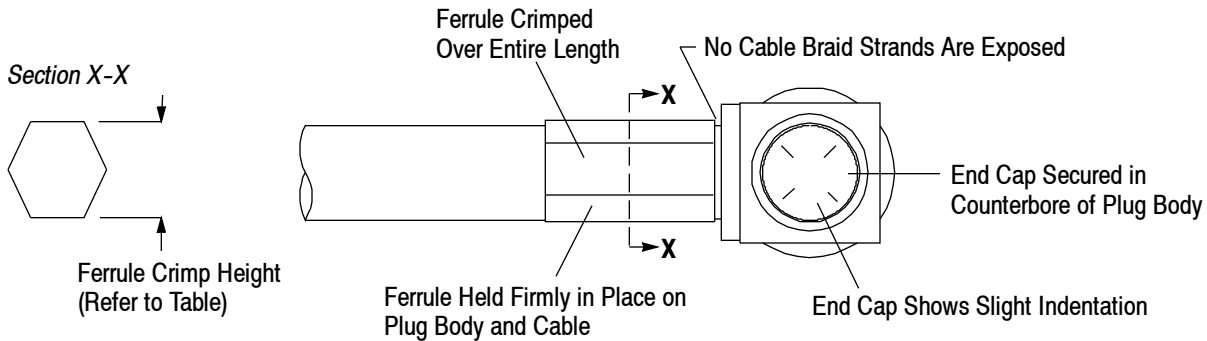
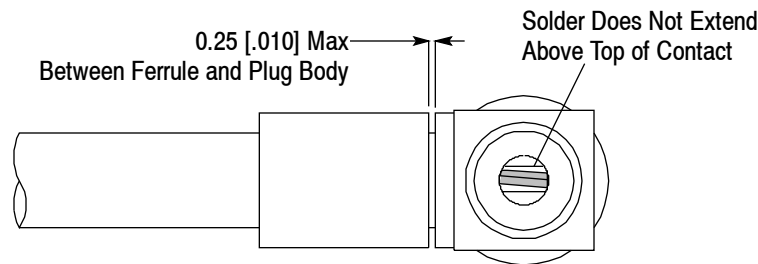
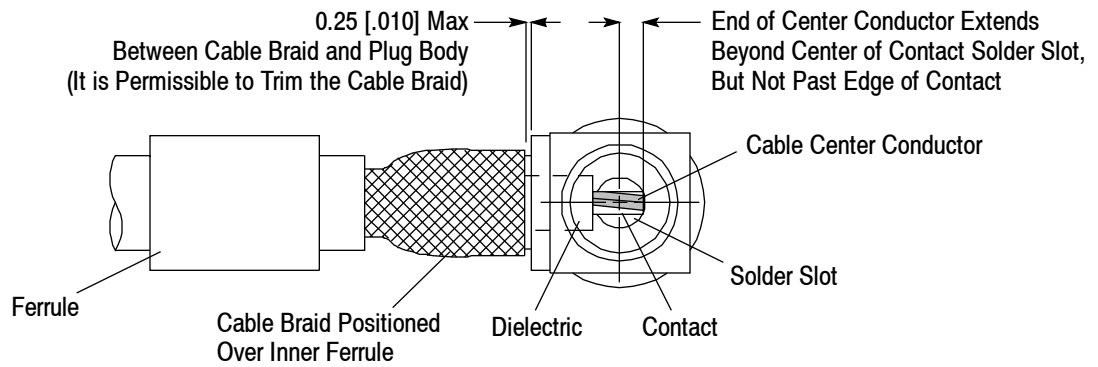
ALPHA, BIOACT, CARBITOL, KESTER, and LONCOTERGE are trademarks of their respective owners.



The developed crimp heights result from using the specific tooling described in Section 5, TOOLING.

These connectors must conform to the requirements shown in Figure 6.

Right-Angle Reverse Polarity Cable Plug



CABLE SIZE (RG/U)	FERRULE CRIMP HEIGHT +0.10/-0.05 [+0.004/-0.002]
174, 188, 316	3.25 [.128]
178, 196	2.67 [.105]
188, 316 (Double Braid)	3.84 [.151]

Figure 6

3.3. Panel Mounting (Bulkhead Jacks Only)

The maximum panel thickness shall be 1.53 [.060]. The panel must be cut using the dimensions provided in Figure 7.

The bulkhead jack can be installed or removed from either the back or the front of the panel. The shoulder of the jack body must be against the panel. The jam nut and lockwasher must be secure to jack body.

Recommended Panel Cutout

Mounting Bulkhead Jack onto Panel

Note: Not to Scale

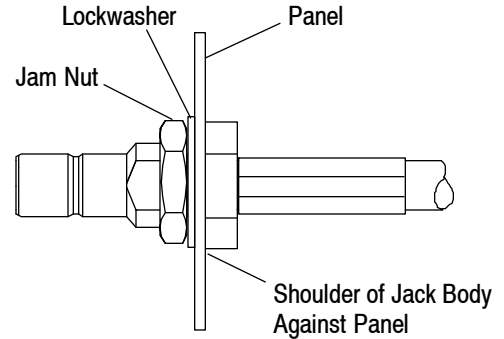
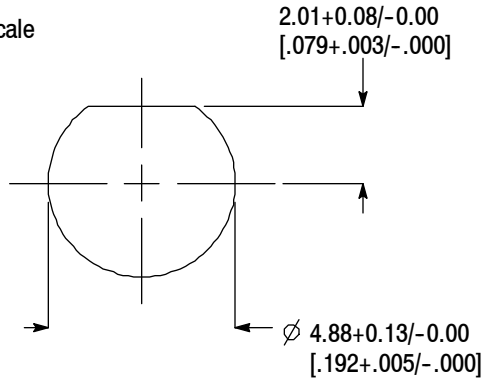


Figure 7

3.4. Strain Relief and Cable Dress

If required, cables can be bundled together and supported with cable ties. Cable must not be stretched or confined in any way that would put stress on the contacts. It is recommended that individual cable be dressed to a bend radius of *at least* ten times the cable outside diameter, and that cable bundles be dressed to a bend radius of *at least* ten times the diameter of the bundle. Refer to Figure 8.

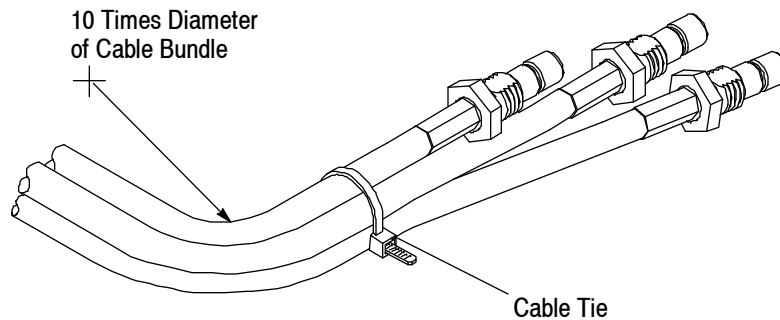


Figure 8

3.5. Replacement and Repair

Any defective or damaged components must be replaced. The components are not repairable. Terminated connectors **MUST NOT** be re-used by removing the wire.

4. QUALIFICATION

SMB connectors do not require agency approval.

5. TOOLING

Tooling part numbers and instructional material packaged with the tooling are shown in Figure 9.

5.1. Heat Gun

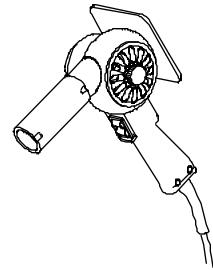
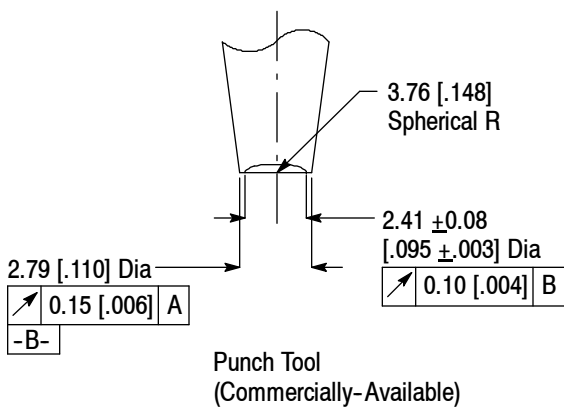
A flameless heat gun is available for applying the heat shrink tubing. Exposed-flame heat sources may be used in environments where flammable materials are not present; however, the flameless heat gun is the recommended heat source. Call PRODUCT INFORMATION at the number at the bottom of page 1 for commercially available heat guns.

5.2. Punch Tool

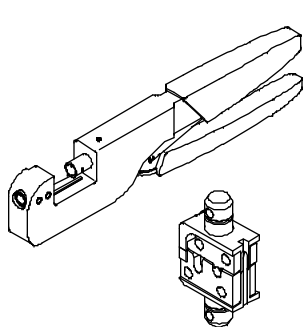
The punch tool is used to install the end cap onto the right-angle reverse polarity jack. The tip of the punch tool must conform with the dimensions given in Figure 9.

5.3. Hand Tool

Hand tools to crimp the contact (if applicable) and ferrule are available to cover the full cable size range. PRO-CRIMPER III hand tool assembly is available to crimp the ferrule, and Daniels Manufacturing Corporation (DMC) tool, positioner, and die sets are available to crimp the contact and ferrule.



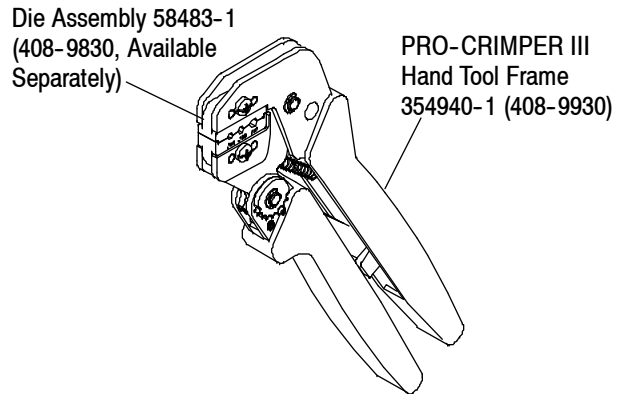
Flameless Heat Shrink Gun
 600655-2 (408-9614)



DMC Tool and Die Set
 (Refer to Table)



DMC Tool and Positioner
 (Refer to Table)



PRO-CRIMPER III Hand Tool Assembly
 58499-1 with Die Assembly 58483-1
 (408-9830)

CRIMP	DMC TOOL	CONNECTOR	DMC POSITIONER OR DIE SET
Contact	AFM8 Military M22520/2-01	Straight Cable Jack	Positioner K1041
		Bulkhead Jack	Positioner K727
		Straight Cable Plug	Positioner K699
Ferrule	HX4 Military M22520/5-01	Straight Cable Plug and Jack	Hex Die Set Y-1637
		Bulkhead Jack	Hex Die Set Y-137

Figure 9

6. VISUAL AID

The illustration below shows a typical application of SMB connectors. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.

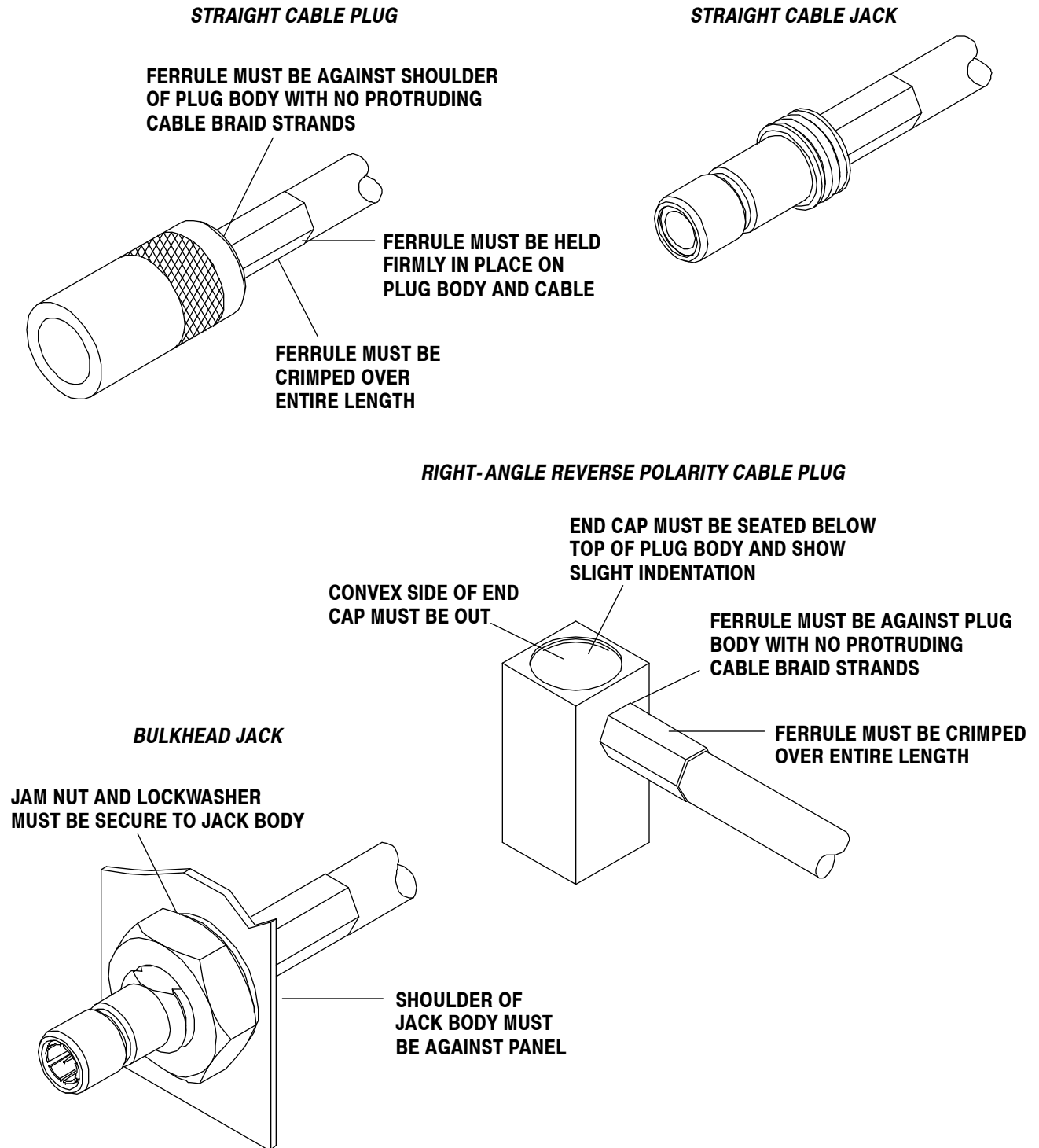


FIGURE 10. VISUAL AID