

**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  $\pm 0.13$  [ $\pm .005$ ] 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 Category 6 Modular Plug Connectors. These requirements are applicable to hand or automatic machine terminating tools. Cables approved for use with these connectors are round Category 6, twisted-pair cables, shielded or unshielded, with 23–24 AWG solid or 24–26 AWG stranded conductors. The insulated conductor outside diameters must be between 0.80 and 1.00 mm [.031 and .039 in.], and a cable jacket outside diameter between 4.7 and 6.0 mm [.185 and .240 in.].

When corresponding with Tyco Electronics 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.

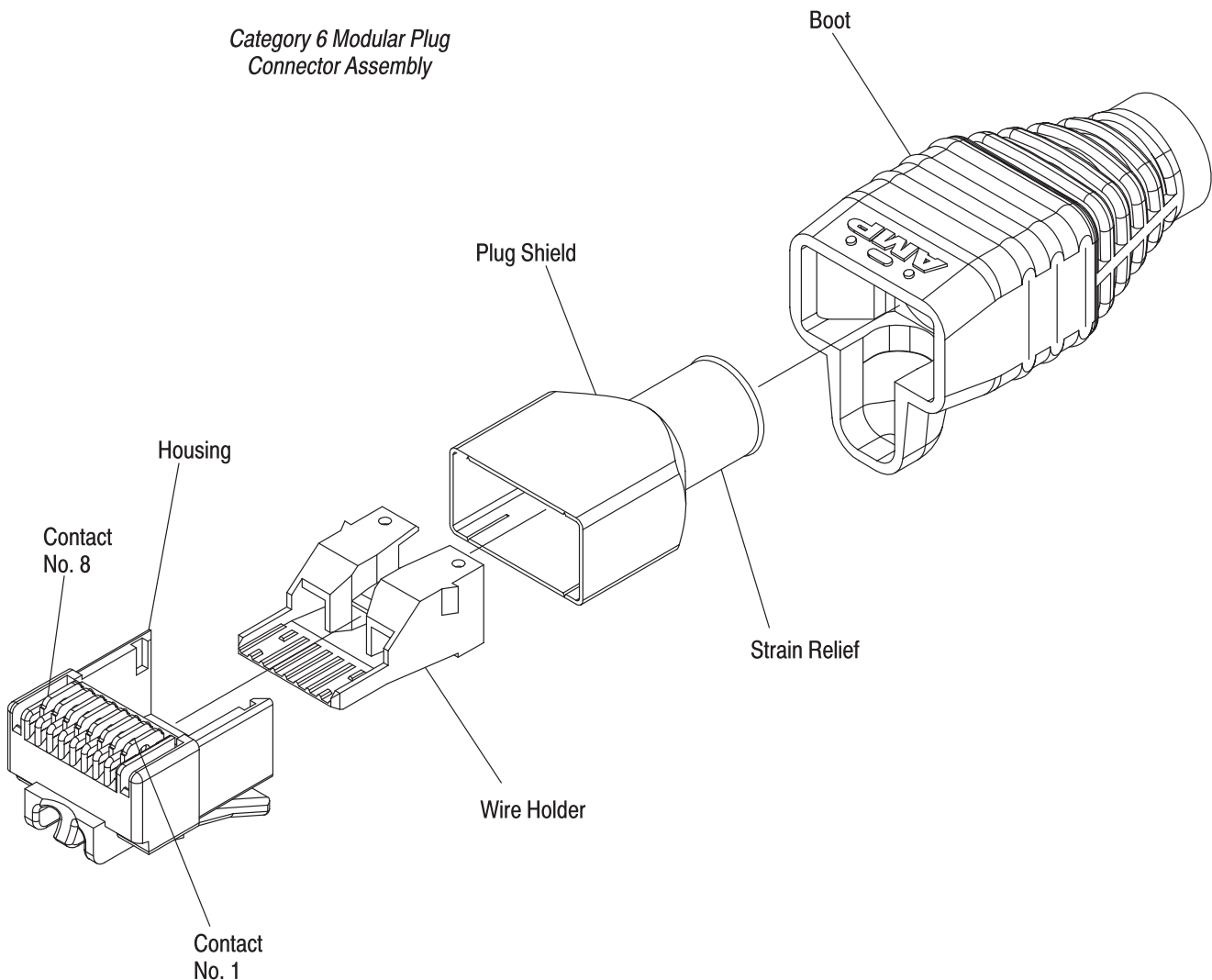


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

This paragraph is reserved for a revision summary of changes and additions made to this specification. The following changes were made for this revision.

- Updated document to corporate requirements
- Changed cable diameter in Section 1, INTRODUCTION; and Paragraph 3.2.A.4
- Changed part numbers in Paragraph 2.2
- Added new information to table in Figure 11

### 2.2. Customer Assistance

Reference Base Part Numbers 1479184, 1479185; and Product Code H129 are representative numbers of 8-Position Category 6 Modular Plug 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 Tyco Electronics Representative or, after purchase, by calling the Tooling Assistance Center or Product Information number at the bottom of page 1.

### 2.3. Drawings

Customer drawings for specific products are available from the service network. The information contained in customer drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by Tyco Electronics.

### 2.4. Specifications

Product Specification 108-1990 provides test results and product performance requirements.

### 2.5. Instructional Material

The following list includes available instruction sheets (408- and 411-series) and customer manuals (409-series) that provide operation, maintenance, and repair of tooling. In addition, follow the instructions and procedures outlined in Paragraph 3.2 of this specification for product assembly procedures.

<u>Document Number</u>	<u>Document Title</u>
408-8734	Terminating Modules 791804-[ ] for Dual-Modular Plug Terminator 1320804-[ ]
408-8738	PRO-CRIMPER* III Hand Tool and Die 790163 for EMT Modular Plug Connectors
408-9930	PRO-CRIMPER II Hand Crimping Tool Frame Assembly 354940-[ ]
409-10010	Modular Plug Dual Terminator 1320840-[ ]
411-22021	PRO-CRIMPER II Hand Tool with Die Assembly 790163-2
411-22022	Dual Terminating Module 791804-1

## 3. REQUIREMENTS

### 3.1. Storage

#### A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the connector components.

#### B. Shelf Life

All component products should remain in the shipping containers until ready for use to prevent damage. These products should be used on a first in, first out basis to avoid storage contamination.

#### C. Chemical Exposure

Do not store connector components near any chemicals listed below, as they may cause stress corrosion cracking in the product.

Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur	Nitrites	Tartrates

#### NOTE

Where the above environmental conditions exist, phosphor-bronze contacts are recommended if available.



### 3.2. Cable

#### A. Cable Specifications

1. Cable Type: Round jacketed, shielded or unshielded, four twisted pairs
2. Conductor Type:
  - a. Solid Conductor: 23 – 24 AWG
  - b. Stranded Conductors: 24 – 26 AWG, 7-strands
3. Conductor Insulation Outside Diameter: 0.80 – 1.00 mm [.031 – .039 in.] for any one conductor. The sum of diameters for all eight conductors within the cable must not exceed 7.8 mm [.320 in.].
4. Cable Jacket Insulation Diameter: 4.7 – 6.0 mm [.185 – .240 in.].
5. Shield Type: Foil with drain wire or braid.
6. Cable Pair Arrangement: The arrangement of color-coded pairs within the cable jacket applicable to TIA/EIA T568B wiring and the termination procedures described in this specification is shown in Figure 2. Cable end A applies to one end of the cable and cable end B to the opposite end. For TIA/EIA T568A wiring or termination of cables with pair arrangements other than shown in Figure 2, contact the responsible Tyco Electronics Engineering Department.

Pair arrangement inside jacket. Looking into end of cable as oriented for termination.

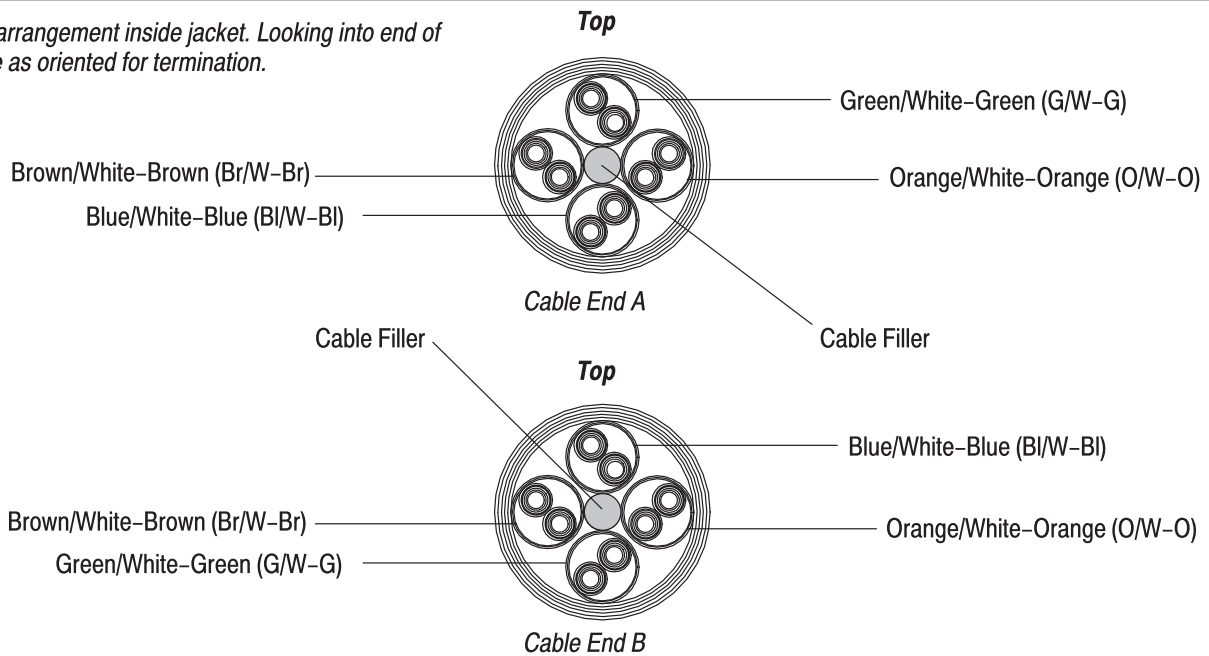


Figure 2

#### B. Cable Preparation (Figure 3)

1. Slide the boot over the end of the cable before the cable stripping operation.
2. Strip the cable jacket as shown.



Do not nick the insulation of the conductors or the shield of the cable (if present).

3. If the cable is shielded, fold the outside shield and drain wire back over the jacket. Individual pair shields must be trimmed back to the end of the jacket.
4. If present, cut and remove any cable filler, zipcord, or plastic wrap.
5. Slide the plug shield over the cable jacket and cable shield (if present).



Do not tear the cable shield. Do not slide the plug shield past the folded-back end of the cable shield.

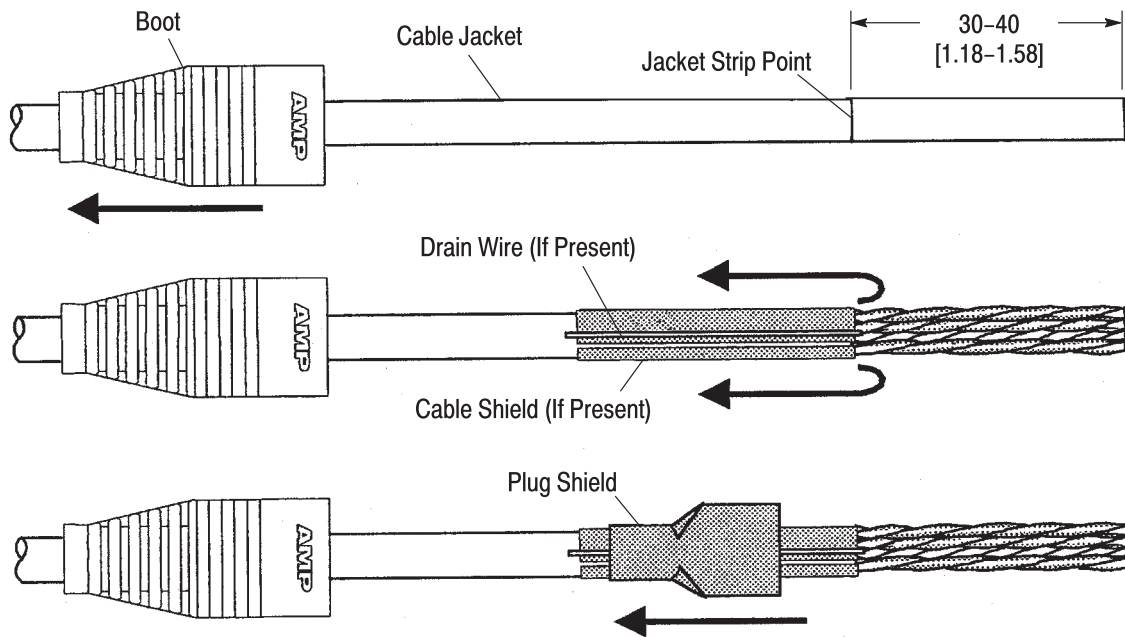


Figure 3

**C. Cable Positioning**

1. While firmly holding the cable jacket next to the stripped end, position the pairs as shown in Figure 4, folding the indicated pair back over the jacket.



Minimize the disturbance of the pair arrangement within or exiting the cable jacket.

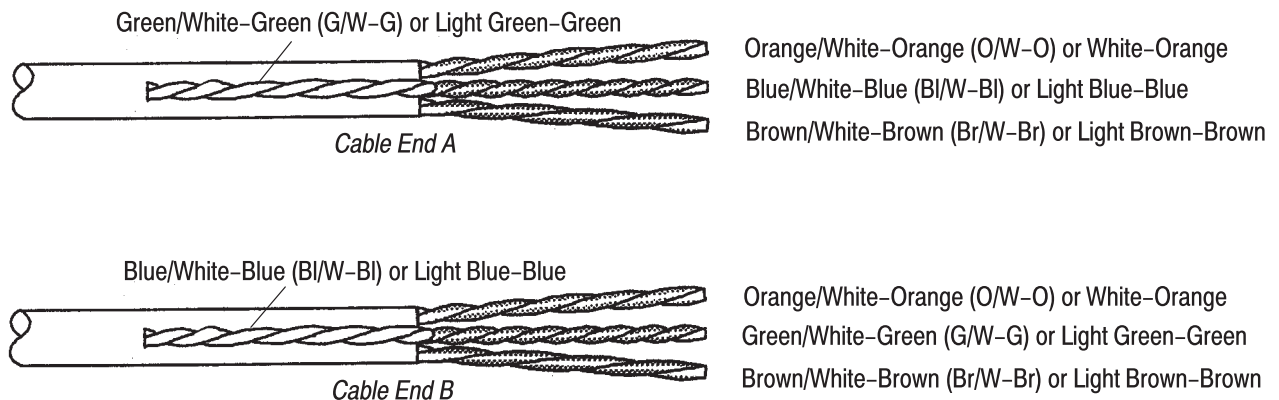


Figure 4

2. Insert the three side-by-side pairs through the wire holder as shown in Figure 5. Slide the wire holder back against the end of the cable jacket. The end of the cable jacket should extend into the end of the wire holder and the folded-back pair should rest in the slot on top of the wire holder.

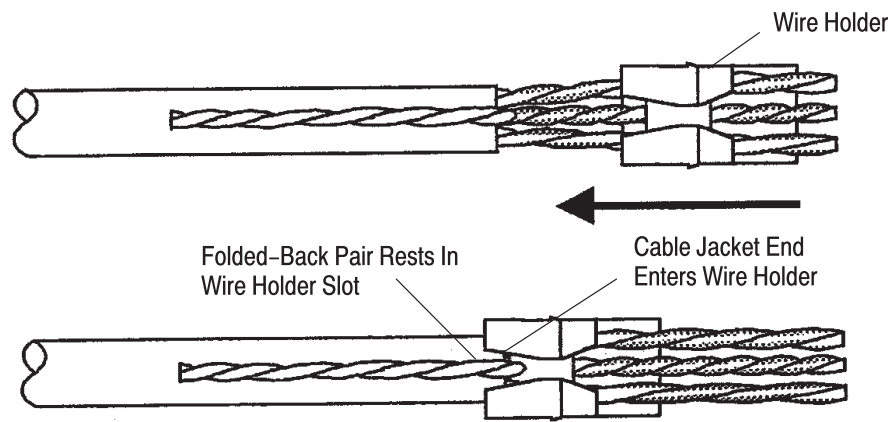


Figure 5

3. Reposition the folded-back pair over the slot in the top of the wire holder. While holding the wire holder and cable jacket firmly together, untwist the pair of conductors to the point where they exit the main body or slot of the wire holder as shown in Figure 6.

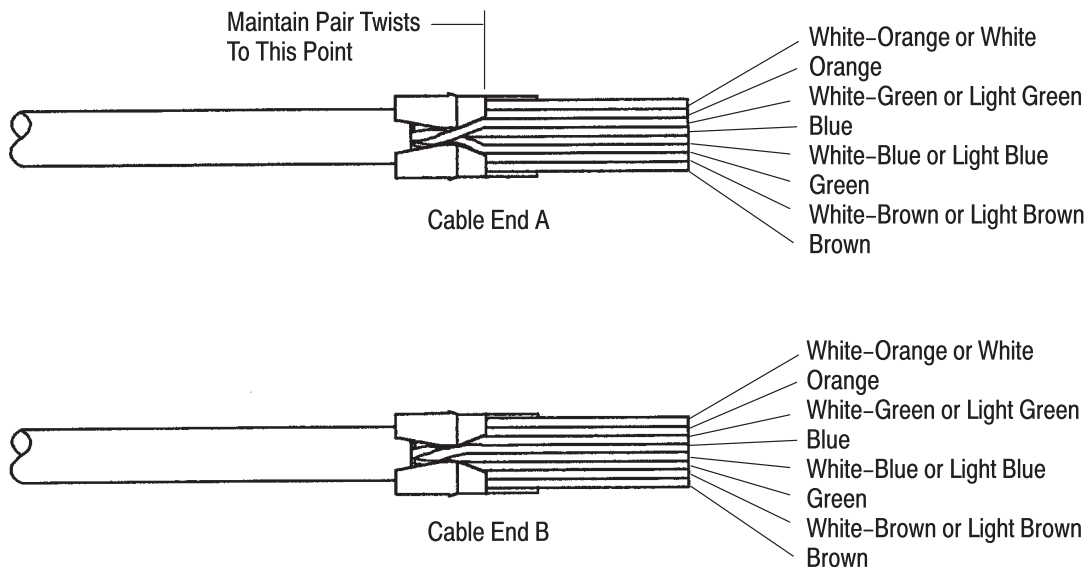
4. Straighten and arrange the conductors side-by-side and parallel according to color code as shown in Figure 6. Note that the G/W-G pair must split to either side of the BI/W-BI pair. Press the conductors flat against the front section of the wire holder.



*Untwist of conductor pairs may be performed before inserting through the wire holder.*



*Maintain the last twist (conductor crossing) of each pair as closely as possible to the point indicated. Up to, but not exceeding, one half untwist may be added to achieve the proper color code arrangement or the split of the G/W-G pair.*



**NOTE:** Conductor Arrangement According to T568B

Figure 6

5. While holding all conductors down against the wire holder in a flat layer, trim all conductors evenly and square just beyond the front edge of the wire holder as shown in Figure 7.

6. Continue holding all conductors down against the wire holder. Insert the front of the wire holder and the ends of the conductors into the cavity of the plug housing. Push the wire holder into the housing until it latches into both sides of the plug housing.
7. Visually verify that all conductors are fully inserted into the housing with the ends of the conductors seated against the end of the housing cavity. If not, push the cable further into the wire holder until it latches into both sides of the plug housing.

**CAUTION**

*Do not rotate the cable relative to the plug and do not allow the wire holder to cock at an angle relative to the plug.*

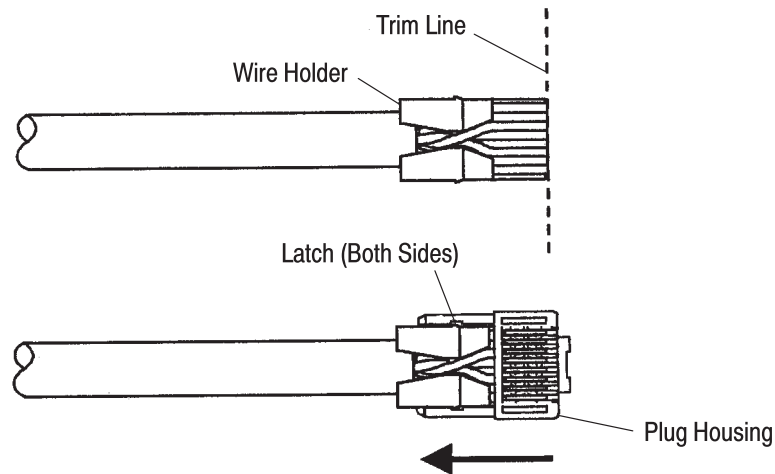


Figure 7

### 3.3. Connector Termination

Refer to Section 5, TOOLING, for appropriate crimp tooling and machines that are compatible with this connector. Refer to Figures 8 and 9 and proceed as follows:

1. Slide the plug shield over the plug subassembly until it seats against the front edge of the recessed area around the outside of the plug housing. See Figure 9,
2. Insert the plug and shield assembly into the appropriate tooling and crimp the connector according to the instruction sheet packaged with the tooling. The shield must be free of bulges, tears, and uniform after the crimping operation.
3. The shield end must be against the raised edge of the housing. The strain relief end must be held firmly in place on the cable. The crimp height must be within the dimension provided in Figure 8.

**CAUTION**

*Continue pushing the cable toward the plug during crimping to ensure that the conductors remain seated against the front of the housing cavity.*

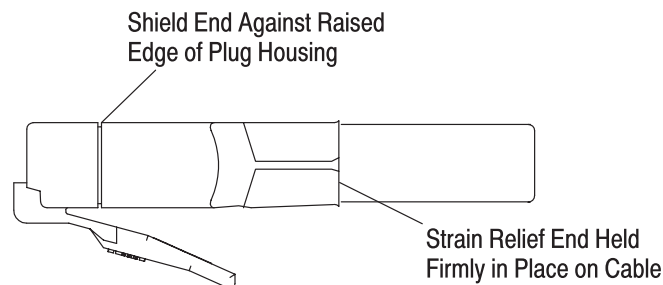


Figure 8

4. If the cable is shielded, trim away any cable shield and drain wire left extending beyond the end of the plug shield. See Figure 9.
5. Slide the boot over the crimped plug and shield. See Figure 9.

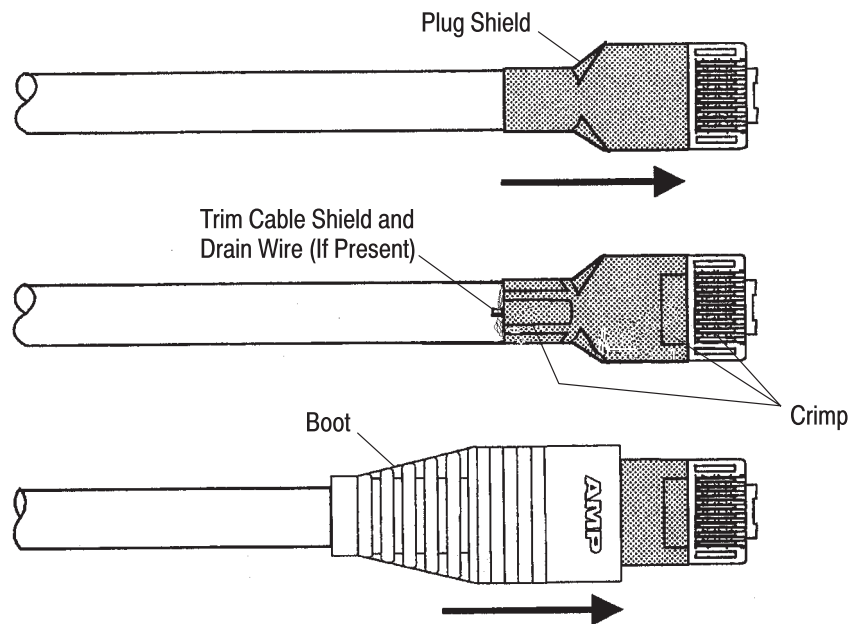


Figure 9

### 3.4. Terminated Connector Requirements

Figure 10 shows a cutaway of a typical terminated plug and the required location of the conductors. A visual inspection through the plastic housing of the plug should reveal whether the conductors are within the acceptable range. For optimum transmission performance, it is preferred that all conductors be fully inserted into the plug housing with the ends of the conductors bottomed against the end of the housing cavity. For reliable electrical termination, the conductors must at least be inserted past the contact and into the 0.80 mm [.032 in.] reference zone.

Inspect connector for proper crimp height using an indicator with needle-point probes or equivalent. The crimp height shall be measured at the front of the contact as shown in Figure 10.

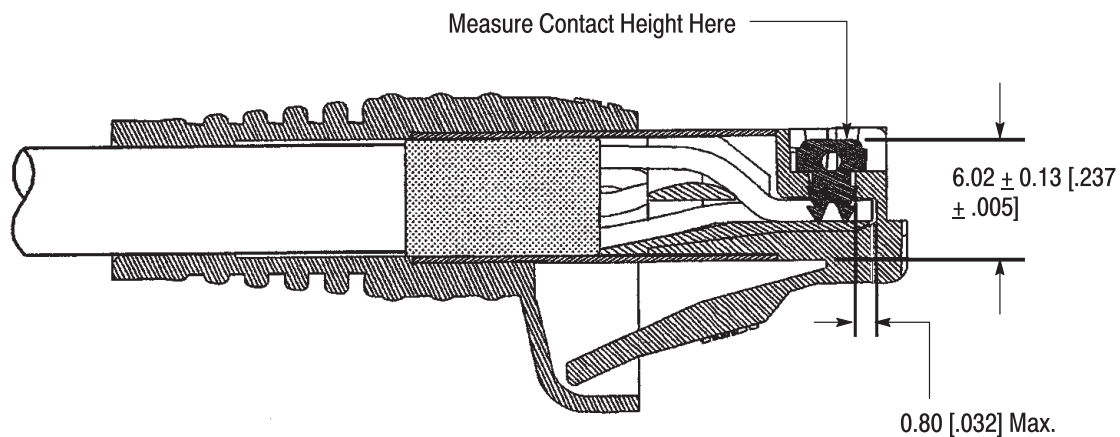


Figure 10



3.5. Repair/Replacement



Damaged components must not be used. If a damaged component is evident, it must be replaced with a new one.

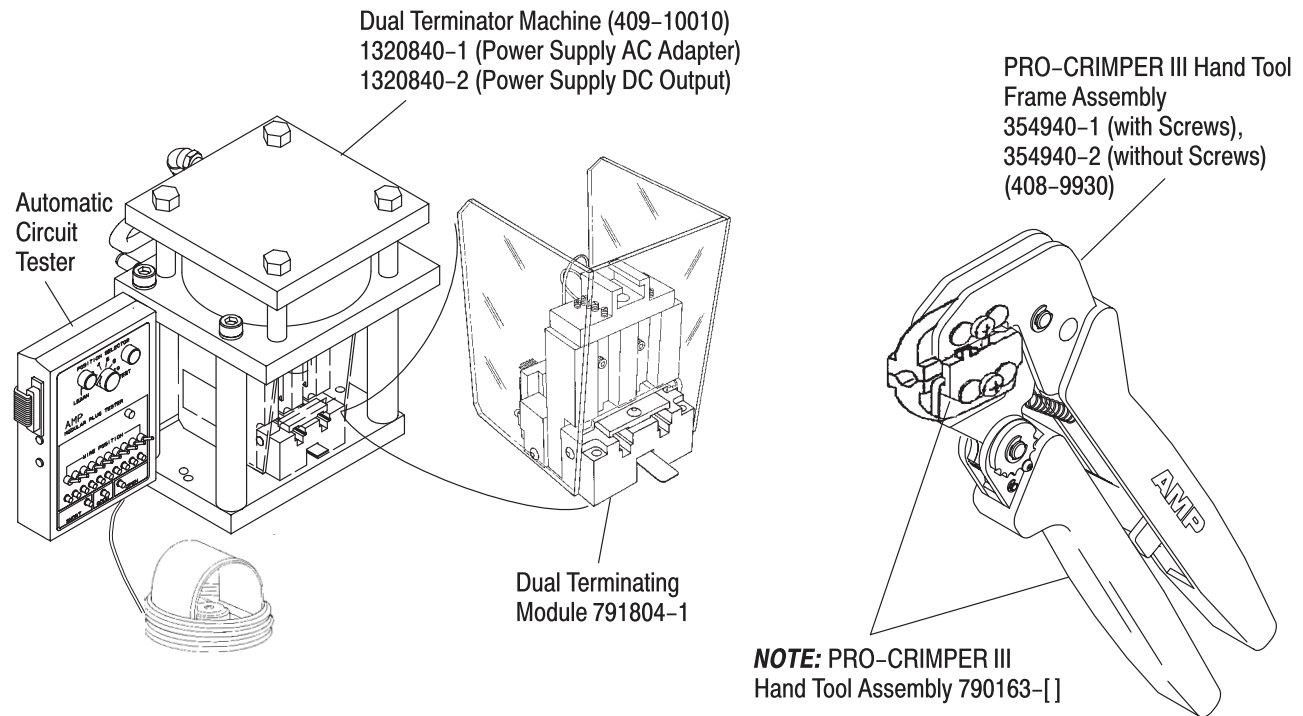
Damaged components must not be used. If a damaged component is evident, it must be replaced with a new one.

4. QUALIFICATIONS

The 8-Position Category 6 Modular Plug Connectors are not required to be agency approved.

5. TOOLING

This section provides a selection of tools for termination of the modular plugs. Hand tools are designed for prototype applications, field terminations, and low volume production. Automatic machines are designed for high productivity cable assembly terminations. Refer to Figure 11 for available termination tooling (and instructional material).



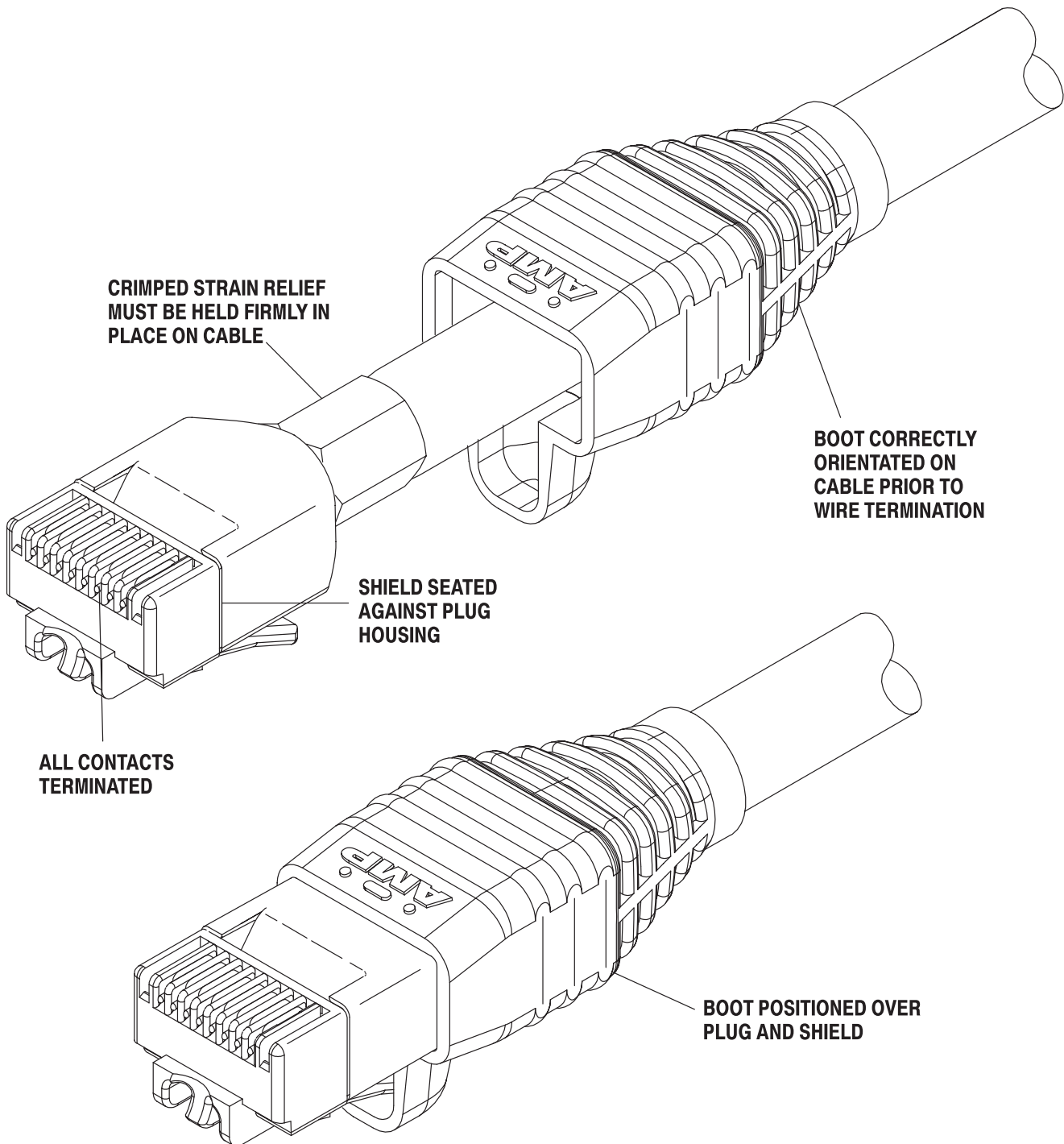
PLUG CONNECTOR THAT ACCEPTS CABLE O.D.	HAND TOOL (DOCUMENT)		POWER UNIT (DOCUMENT)
	PRO-CRIMPER III HAND TOOL ASSEMBLY	DIE SET ONLY	
4.7-5.3 [.185-.209]	790163-7 (408-8738)	790163-8 (408-8738)	791804-4 (408-8734)
5.0-6.0 [.197-.236]	790163-1 (408-8738)	790163-2 (408-8738)	791804-1 (408-8734)
6.0-7.0 [.236-.276]	790163-5 (408-8738)	790163-6 (408-8738)	791804-3 (408-8734)

Figure 11



## 6. VISUAL AID

Figure 12 shows typical applications of Modular Plug Connectors. These illustrations 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 12. VISUAL AID**