

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 [.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 AMP* PIDG (Pre-Insulated Diamond Grip) Terminals, Splices, and End Caps. Each consists of a precision formed metal wire barrel and a copper sleeve encased in insulating material. There are insulating materials for various conditions of heat and hardness to accommodate a wide variety of application requirements. Terminals, splices, and end caps are available for a combination of solid and stranded wire sizes. There are terminal and splice designs for 26 through 10 AWG, and end cap designs for 22 through 10 AWG. The terminals, splices, and end caps are available loose piece to be terminated with manual and pneumatically-powered hand held tools, and tape mounted items to be terminated with hand tools and bench mount machines designed for tape mount products.

When corresponding with AMP personnel, use the terminology provided on this specification to help facilitate your inquiry for information. Terminals, splices, and end caps will be referred to collectively as product throughout this specification, except when specific description is necessary for clarity. Basic terms and features, and style variations of the products are provided in Figure 1.

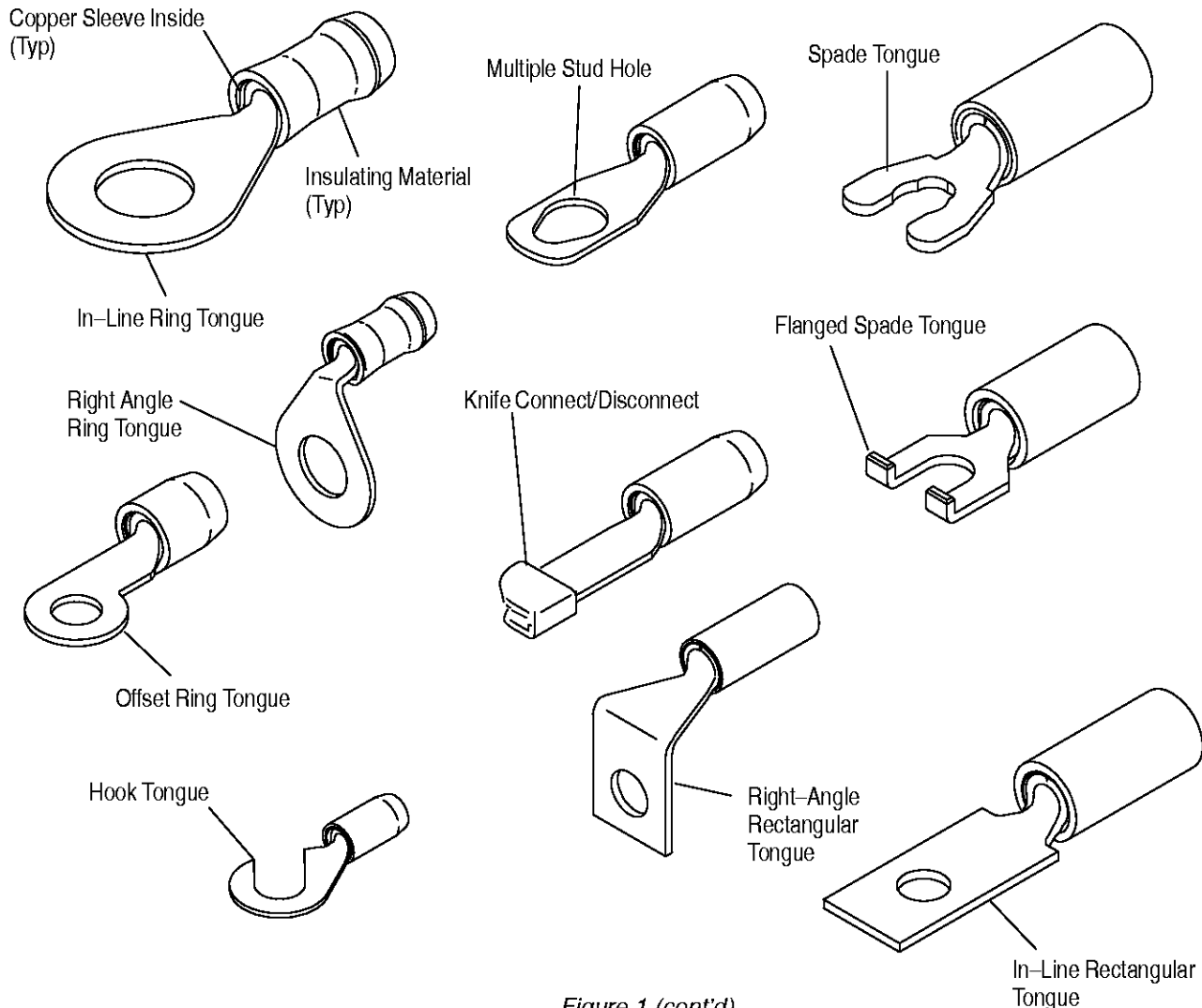


Figure 1 (cont'd)

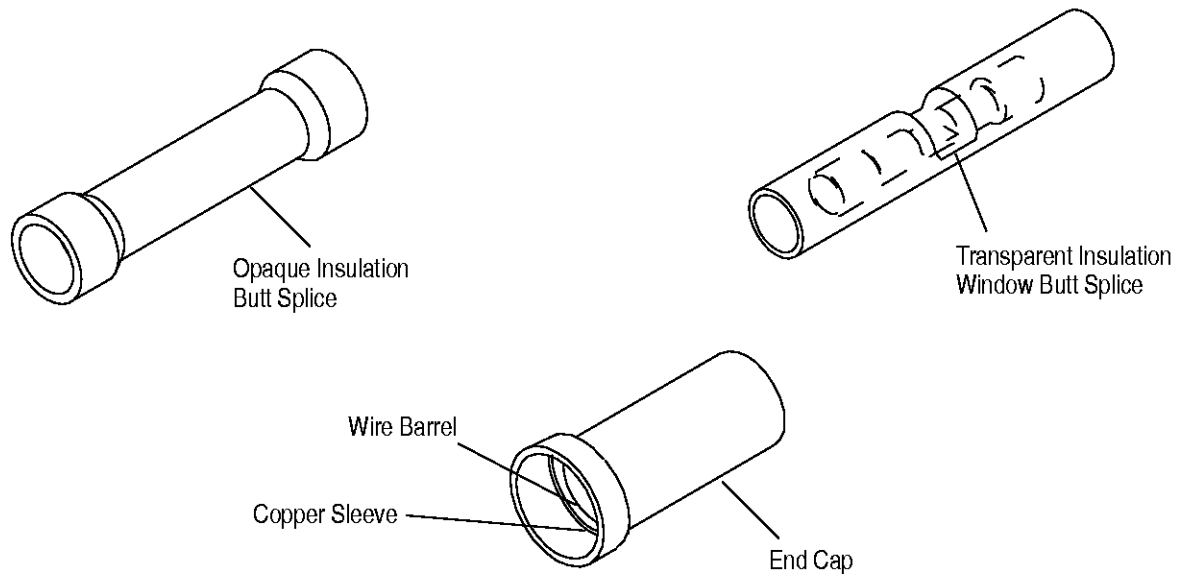


Figure 1 (end)

2. REFERENCE MATERIAL

2.1. Revision Summary

EC 0990-0348-98

- Initial release of this application specification

2.2. Customer Assistance

Reference Part Number 130654 and Product Code 3020 are representative numbers of AMP PIDG Terminals, Splices, and End Caps. Use of these numbers will identify the product line and expedite your inquiries through an AMP service network established to help you obtain product and tooling information. Such information can be obtained through a local AMP Representative (Field Sales Engineer, Field Applications Engineer, etc) or, after purchase, by calling the Tooling Assistance Center or the AMP FAX/Product Information Center number at the bottom of page 1.

2.3. Drawings

AMP Customer Drawings for product numbers are available from the service network. The information on the customer drawing and this specification takes priority over any other document supplied by AMP Incorporated. If there is a conflict with the information on the customer drawing and this specification call either of the customer service numbers at the bottom of page 1 for assistance.

2.4. Specifications

No product specifications are available for the terminals, splices, and end caps.

2.5. Instructional Material

The following list includes available AMP instruction sheets (408-series) and customer manuals (409-series) that provide tool operation, maintenance, and repair of tools used to terminate these products.

A. Instruction Sheets

- 408-1261 Hand Crimping Tools with Heavy Duty Head for 12-10 AWG
- 408-1559 Hand Crimping Tools for 30-14 AWG
- 408-1610 Hand Crimping Tools for 26-14 AWG
- 408-1632 Crimping Dies use in "C"-Head Hand and 626 Pneumatic Tooling for 26-10 AWG
- 408-2095 "C"-Head Hand Tool Frame Assembly for dies
- 408-2423 Crimping Dies used in AMP-TAPETRONIC* Machines for 22-10 AWG (not 12-10 window splices)

- 408-2498 Tool Holder Assemblies for 626 Pneumatic Tool System
- 408-2822 Crimping Dies used in AMP-TAPETRONIC Machines for 22-10 AWG (all product)
- 408-2823 TETRA-CRIMP* Hand Crimping Tools for 22-10 AWG
- 408-4099 TETRA-CRIMP Adapter for dies used in 626 Pneumatic Tool System
- 408-4105 Straight Action Crimping Head for dies used in 626 Pneumatic Tool System
- 408-7424 Checking Crimp Height
- 408-8044 Heavy-Duty Miniature Applicator for AMPOMATOR* Machine
- 408-8082 Heavy-Duty Miniature Applicator for Model "T" Terminating Unit
- 408-8088 Applicator for AUTO-PRO* Terminating Machine
- 408-9252 PRO-CRIMPER* Hand Crimping Tool for 22-10 AWG
- 408-9491 AUTO-PRO Terminating Machine
- 408-9586 Crimping Head use in 626 Pneumatic Tool System for 26-14 AWG

B. Customer Manuals

- 409-1993 AMP-TAPETRONIC Machine
- 409-5289 Model "T" Terminating Unit used in AMPOMATOR IV Machine
- 409-5842 AMP-O-ELECTRIC* Model "G" Bench Mount Machine
- 409-5862 Setup and Operation for 626 Pneumatic Tools
- 409-5878 AMPOMATOR CLS IV+ Machine

3. REQUIREMENTS

3.1. Special Characteristics

The pre-insulated terminals, splices, and end caps are available with either nylon, vinyl, or polyvinyl fluoride covering. The insulation is color coded to correspond with a specific wire size or wire size range. The insulation may be a solid primary color only, or a primary color with a color stripe and designated by primary color/color stripe when referred to in this specification.

There are serrations inside the wire barrel that provide maximum contact and tensile strength to solid or stranded wire. The terminals are available with a variety of tongue lengths and configurations. All products are also available with various wire barrel lengths and wire barrel diameters to accommodate different wire sizes, wire types, and combination of wire sizes.

These products are suitable for 300 volts maximum and temperatures up to 105°C [221°F].

3.2. Storage

A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the insulation material.

B. Reel Storage

Tape-mounted reeled product should be stored horizontally to prevent sagging and possible stretching or distortion of the plastic tape which could adversely affect feeding of the product through the tooling.

C. Shelf Life

The product should remain in the shipping containers until ready for use to prevent inadvertent damage. The product should be used on a first in, first out basis to avoid storage contamination that could adversely affect signal transmissions.

D. Chemical Exposure

Do not store product near chemicals listed below. They could cause stress corrosion cracking of product.

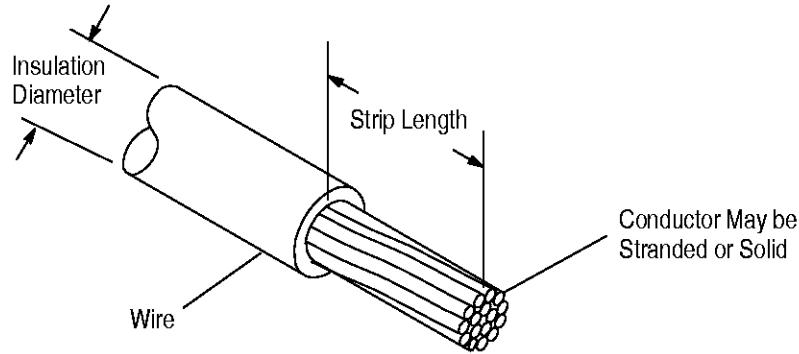
Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfides	Nitrites	Tartrates

3.3. Strip Length

Generally, the strip length of the wire should be equal to the wire barrel length plus 0.76 [0.03]. For specific strip lengths, see Figure 2.

NOTE Do not nick, scrape, or cut the wire conductor during the stripping operation.

NOTE: Not to Scale



WIRE SIZE (AWG)	INSULATION		WIRE STRIP LENGTH					
	COLOR	DIAMETER (Range)	TERMINALS		SPLICES		END CAPS	
			MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
26	Yellow/Black	0.66-1.40 [.026-.055]	6.35 [.250]	7.14 [.281]	N/A	N/A	N/A	N/A
26-24	Yellow	Multiple Wire Range◊	5.16 [.203]	5.94 [.234]	4.37 [.172]	5.16 [.203]	N/A	N/A
26-22	Yellow	Multiple Wire Range◊	3.96 [.156]	4.78 [.188]	4.37 [.172]	5.16 [.203]	N/A	N/A
24	Yellow/Blue	0.79-1.40 [.031-.055]	4.78 [.188]	5.56 [.219]	N/A	N/A	N/A	N/A
24†	Yellow/Blue	0.79-1.40 [.031-.055]	6.35 [.188]	7.14 [.281]	N/A	N/A	N/A	N/A
24-20	White	Multiple Wire Range◊	4.78 [.188]	5.56 [.219]	5.56 [.219]	6.35 [.250]	N/A	N/A
24-20	Natural/White	Multiple Wire Range◊	4.78 [.188]	5.56 [.219]	5.56 [.219]	6.35 [.250]	N/A	N/A
22	Red/Green	0.97-2.79 [.038-.110]	6.35 [.250]	7.13 [.281]	N/A	N/A	N/A	N/A
22-16	Red	Multiple Wire Range◊	5.16 [.203]	5.94 [.234]	6.35 [.250]	7.13 [.281]	7.95 [.313]	8.74 [.344]
22-16	Natural/Red	Multiple Wire Range◊	5.16 [.203]	5.94 [.234]	6.35 [.250]	7.13 [.281]	N/A	N/A
20	Red/Red	1.17-2.79 [.046-.110]	6.35 [.250]	7.13 [.281]	N/A	N/A	N/A	N/A
18	Red/White	1.42-2.79 [.056-.110]	6.35 [.250]	7.13 [.281]	N/A	N/A	N/A	N/A
16	Blue/Blue	1.60-3.30 [.063-.130]	6.35 [.250]	7.13 [.281]	N/A	N/A	N/A	N/A
16-14	Natural/Blue	Multiple Wire Range◊	5.16 [.203]	5.94 [.234]	6.35 [.250]	7.13 [.281]	N/A	N/A
16-14	Blue	Multiple Wire Range◊	5.16 [.203]	5.94 [.234]	6.35 [.250]	7.13 [.281]	7.95 [.313]	8.74 [.344]
14	Blue/Green	1.98-3.30 [.078-.130]	6.35 [.250]	7.13 [.281]	N/A	N/A	N/A	N/A
16-14●	Yellow/Black	Multiple Wire Range◊	7.93 [.312]	8.71 [.343]	N/A	N/A	N/A	N/A
12	Yellow/Yellow	2.41-5.08 [.095-.200]	9.53 [.375]	10.31 [.406]	N/A	N/A	N/A	N/A
12-10	Natural/Yellow	Multiple Wire Range◊	7.93 [.312]	8.71 [.343]	8.71 [.343]	9.53 [.375]	N/A	N/A
12-10	Yellow	Multiple Wire Range◊	7.93 [.312]	8.71 [.343]	8.71 [.343]	9.53 [.375]	8.74 [.344]	9.53 [.375]
10	Yellow/Brown	3.02-5.08 [.119-.200]	9.53 [.375]	10.31 [.406]	N/A	N/A	N/A	N/A

● Heavy duty terminals with material thickness of 1.02 to 1.27 [.040-.050].
 † Special large sleeve terminal for Class I Applications.
 ◊ There is product designed for the full wire range with no single insulation range requirement.

Figure 2

3.4. Wire Placement

The product must be placed in the tooling according to the instructions packaged with the tooling (see Section 5). The stripped conductor must be inserted into the wire barrel until the insulation is against the wire barrel but not inside it. Also the insulation of the wire must be inside the insulation of the product. See Figure 3.

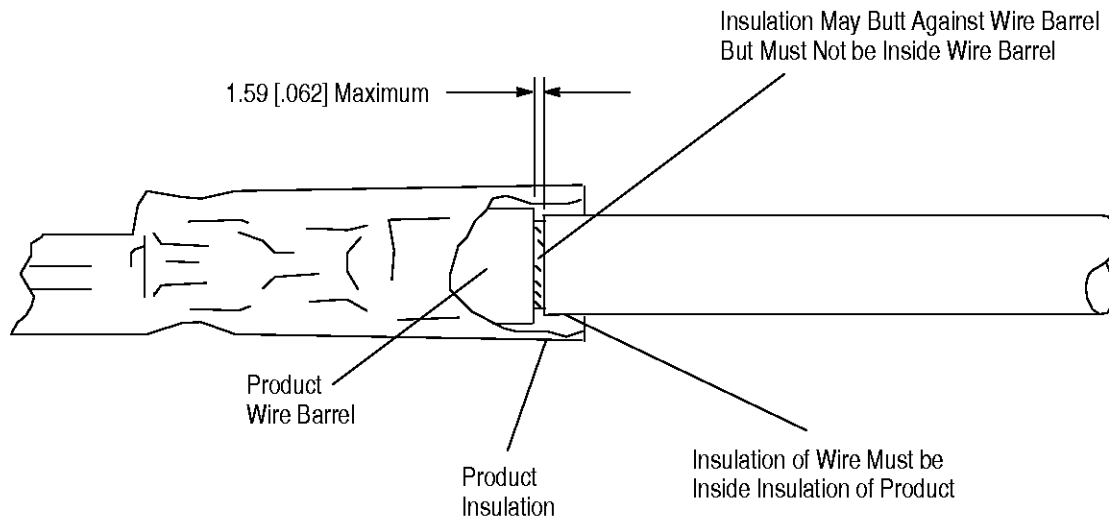


Figure 3

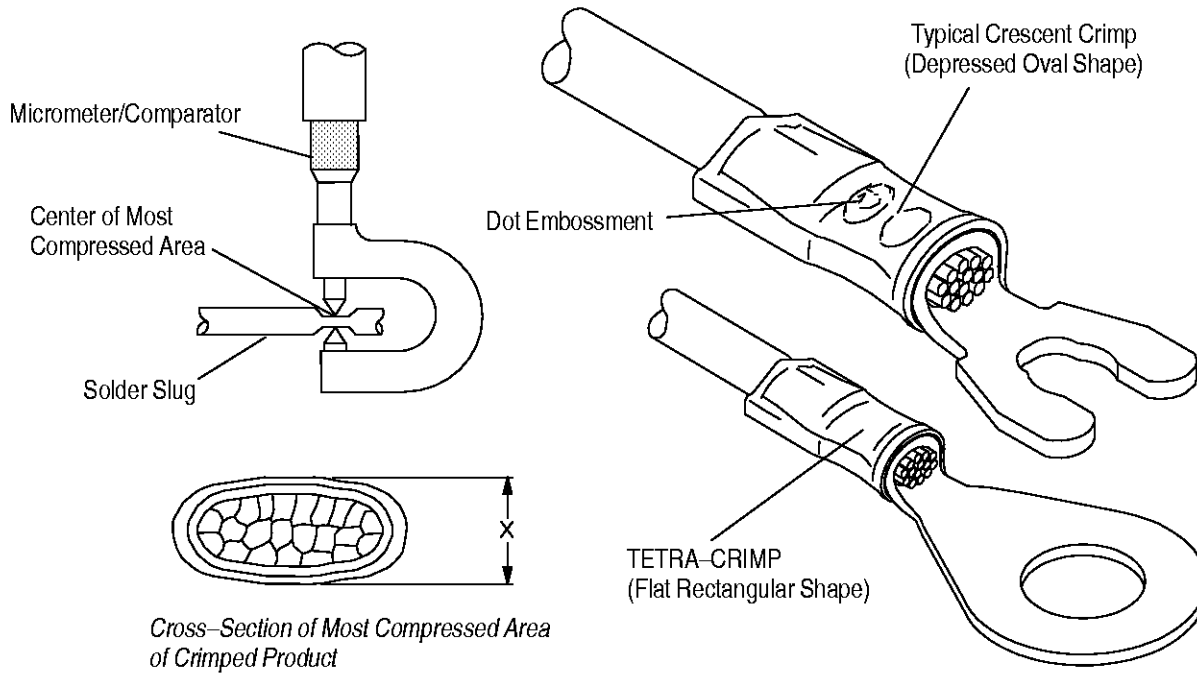
3.5. Crimp Height

The crimp configuration produced by the crimping tool will be either a confined Crescent Crimp which produces an impressed oval shape over the wire barrel portion of the product or a TETRA-CRIMP which produces a flat rectangular shape over the wire barrel portion of the product. See Figure 4.

The springback of the insulation prevents an accurate direct measurement of crimped product. However, crimp height can be used to verify proper termination by crimping a piece of (60% tin and 40%) lead solder with a diameter comparable to the wire size being used. The resulting solder slug can then be checked with a standard micrometer, or a comparator designed specifically for measuring crimp height. The measurement must be made over the most compressed area of the solder slug. See Figure 4.

NOTE

Some tools with multiple crimp areas form a dot embossment in the insulation material to indicate which crimp area was used to crimp the product. This dot pattern can be used as a visual inspection to ensure correct wire size and tool crimp area were used.



Cross-Section of Most Compressed Area of Crimped Product

WIRE SIZE (AWG)	INSULATION COLOR CODE	SOLDER SLUG DIAMETER	CRIMP HEIGHT	
			CRESCENT CRIMP (Oval Shape)	TETRA-CRIMP (Rectangular Shape)
26	Yellow/Black	3.18 [.125]	1.60-1.75 [.063-.069]	N/A
26-24	Yellow	3.18 [.125]	1.60-1.75 [.063-.069]	N/A
26-22	Yellow	3.18 [.125]	1.60-1.75 [.063-.069]	N/A
24	Yellow/Blue	3.18 [.125]	1.60-1.75 [.063-.069]	N/A
24-20	White	3.18 [.125]	2.26-2.41 [.089-.095]	N/A
24-20	Natural/White	3.18 [.125]	2.26-2.41 [.089-.095]	N/A
22	Red/Green	3.18 [.125]	2.77-2.92 [.109-.115]	1.98-2.18 [.078-.086]
22-16	Red	3.18 [.125]	2.77-2.92 [.109-.115]	1.98-2.18 [.078-.086]
22-16	Natural/Red	3.18 [.125]	2.77-2.92 [.109-.115]	1.98-2.18 [.078-.086]
20	Red/Red	3.18 [.125]	2.77-2.92 [.109-.115]	1.98-2.18 [.078-.086]
18	Red/White	3.18 [.125]	3.02-3.18 [.119-.125]	2.34-2.54 [.092-.100]
16	Blue/Blue	3.18 [.125]	3.02-3.18 [.119-.125]	2.34-2.54 [.092-.100]
16-14	Blue	4.76 [.1875]	3.02-3.18 [.119-.125]	2.34-2.54 [.092-.100]
16-14	Natural/Blue	4.76 [.1875]	3.02-3.18 [.119-.125]	2.34-2.54 [.092-.100]
14	Blue/Green	4.76 [.1875]	3.02-3.18 [.119-.125]	2.34-2.54 [.092-.100]
16-14●	Yellow/Black	6.35 [.250]	4.29 4.45 [.169-.175]	3.25-3.45 [.128-.136]
12	Yellow/Yellow	6.35 [.250]	4.29 4.45 [.169-.175]	3.25-3.45 [.128-.136]
12-10	Yellow	6.35 [.250]	4.29 4.45 [.169-.175]	3.25-3.45 [.128-.136]
12-10	Natural/Yellow	6.35 [.250]	4.29 4.45 [.169-.175]	3.25-3.45 [.128-.136]
10	Yellow/Brown	6.35 [.250]	4.29 4.45 [.169-.175]	3.25-3.45 [.128-.136]

● Heavy duty terminals with material thickness of 1.02 to 1.27 [.040-.050].

Figure 4

3.6. Tensile Strength

Crimped products should hold the wire firmly and have a pull-test tensile value meeting that specified in the table in Figure 5.

NOTE Adjust tensile testing machine for head travel of 25.4mm [1 inch] per minute. Directly and gradually apply force for 1 minute.

WIRE SIZE (AWG)	TENSILE STRENGTH (PULL-TEST)			
	COMMERCIAL REQUIREMENTS		MILITARY REQUIREMENTS	
	METRIC (Newtons)	U.S. CUSTOMARY (Inch Pounds)	METRIC (Newtons)	U.S. CUSTOMARY (Inch Pounds)
26	13.4	3	31.1	7
24	22.3	5	44.5	10
22	35.6	8	66.7	15
20	57.9	13	84.5	19
18	89.0	20	169.0	38
16	133.5	30	222.5	50
14	222.5	50	311.5	70
12	311.5	70	489.3	110
10	356.0	80	667.2	150

Figure 5

3.7. Terminated Product Inspection

A. Wire Size

The wire size used must be within the range stamped on the underside of the terminal tongue or on the center of the splice. See Figure 6.

B. Wire Insulation

The insulation of the wire must not be crimped inside the wire barrel of the product. The insulation of the wire must be inside the insulation of the product to provide strain relief for the wire. See Figure 6.

C. Flash

There shall be no flash or extruded insulation material visible in the area where the crimping tool dies meet. See Figure 6.

D. Product Insulation

Terminated product must not be cut or show uneven stress marks or highlighted marks on the insulation.

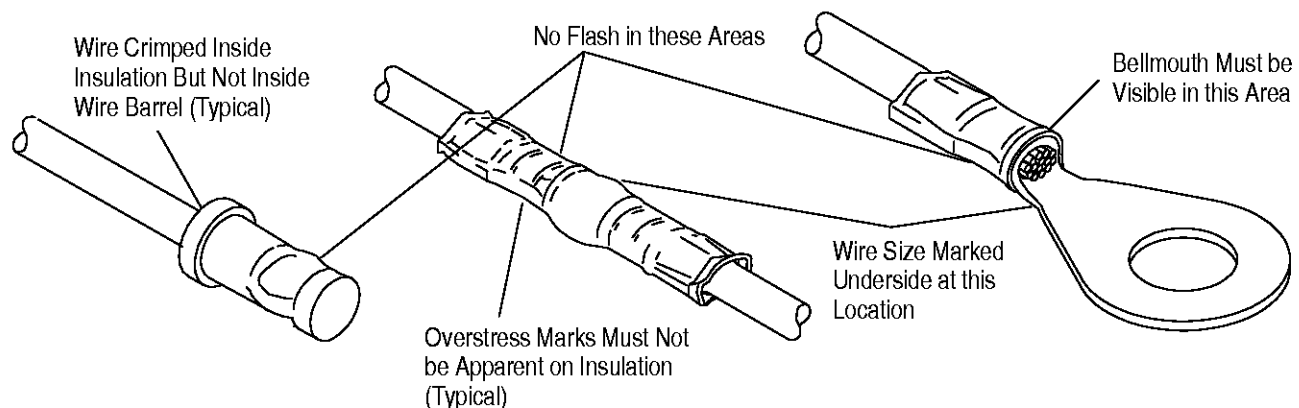
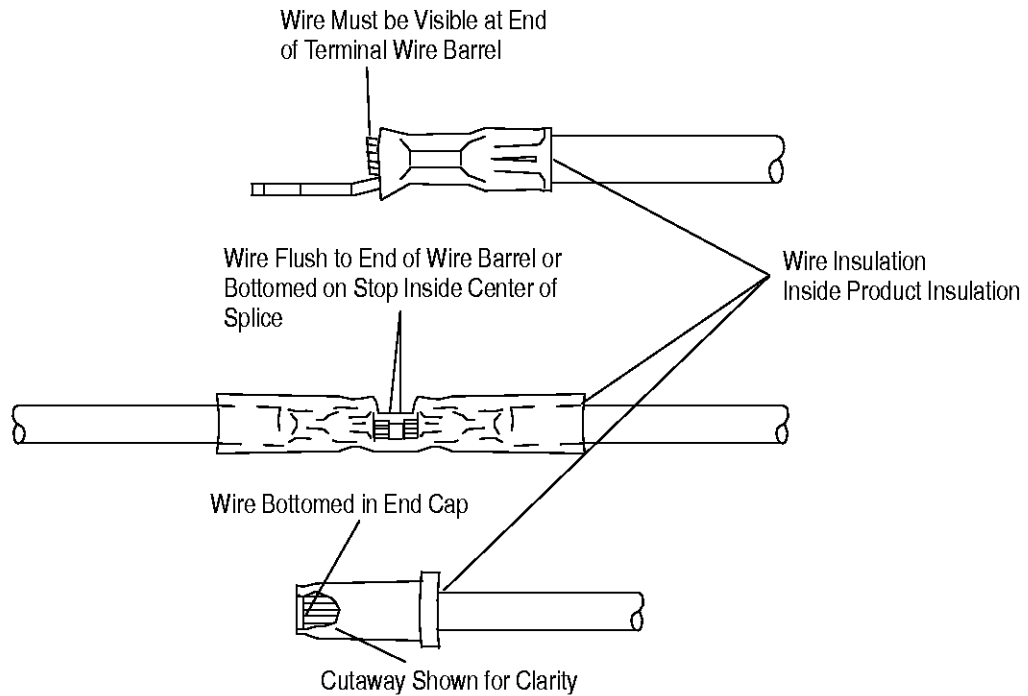


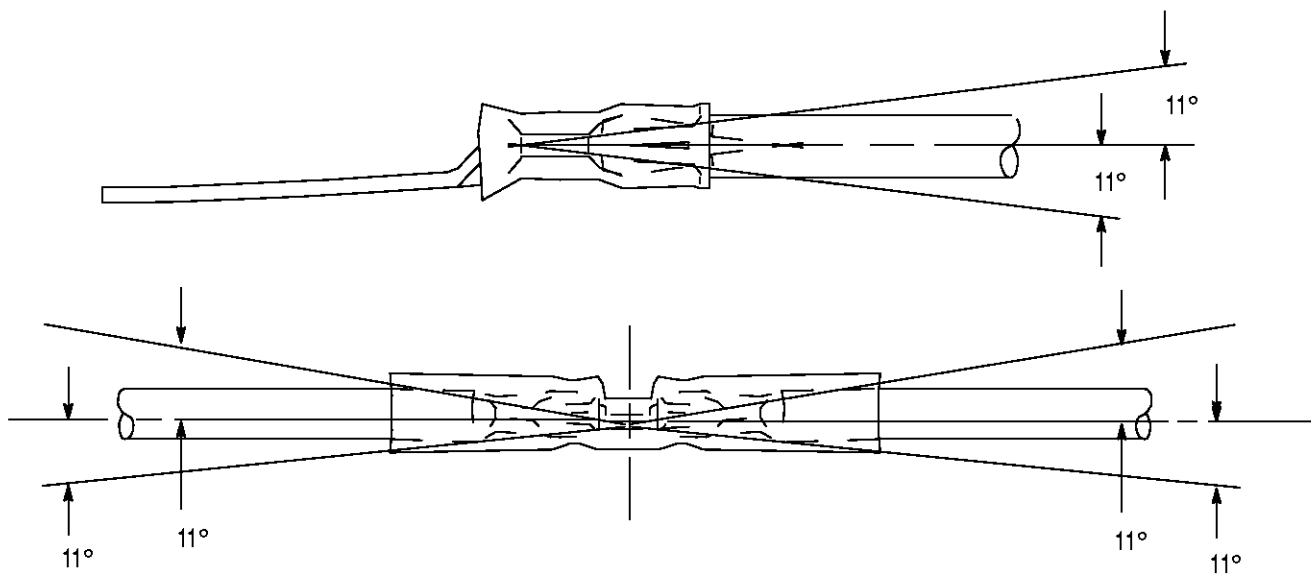
Figure 6

E. End of Wire (Figure 8)

1. Terminals shall have the wire end flush or extended slightly beyond the end of the wire barrel.
2. Splices shall have the end of the wire located against the wire stop inside the center of the splice.
3. End caps shall have the end of the wire bottomed in the end cap.

*Figure 7***F. Bend Allowance**

Upward and downward bend of the terminated product must be within the tolerance provided in Figure 8.

*Figure 8*

4. QUALIFICATIONS

AMP PIDG Terminals, Splices, and End Caps meet Class I and II Military requirements of MS 25036, M7928/1, /4, /5, and /6. They are listed by Underwriters Laboratories Inc. (UL) under file number E13288 and certified by Canadian Standards Association (CSA) under the file number LR7189.

5. TOOLING (Figure 9)

This section describes a selection of tools for various application requirements. They include hand tools for manual application of loose piece form products, and semi-automatic and automatic machines for power assist application of tape-mounted product. The selection of tooling will depend on production requirements such as quantity of terminations, operator training and skill, and the available support equipment (electrical, pneumatic, etc) in the work area. Modified designs and additional tooling concepts may be available to meet other production requirements. For additional information, contact one of the service groups at the bottom of page 1. A listing of tooling recommendations covering the full wire size range is provided in Figure 9.

5.1. Hand Crimping Tools

There are hand crimping tools consisting of a handle assembly with integral fixed jaws or fixed dies. Each handle assembly includes a ratchet to ensure full crimping pressure is applied to the product. The jaws or dies may have one or more crimp areas designed for a specific wire size and product type.

5.2. Hand Tool Frame Assemblies

These manually operated hand tools accept the various die assemblies designed for loose piece terminals and splices. They have a ratchet that will ensure full crimping of the product.

5.3. Crimping Dies and Applicators

Crimping dies and applicators are precision tools that form the wire barrel of the product onto the conductor of the wire and form the optimum crimp height for the product. They have been designed to simplify tooling changes and avoid unnecessary duplication of power units.

A. Dies for Loose Piece (LP) Product

These die assemblies consist of stationary and movable die halves that are designed for a specific wire size and can be used in either manual or power assist tools.

B. Dies for Tape Mounted (TM) Product

These die assemblies consist of stationary and movable die halves that are designed for a specific wire size and terminal, splice, or end cap type. They are designed for used in the AMP-TAPETRONIC stationary bench-mounted power units.

C. Applicators

The applicators are assemblies used in power units for large production applications. They feature an automatic feed mechanism, adjustable crimp height pads, and precision crimping dies.

5.4. 626 Pneumatic Tool System

This pneumatically operated tooling system will crimp the full wire size range of all terminals, splices, and end caps. It is a pneumatic power unit available with a logic control for foot pedal operation or without foot pedal for hand operation. It is designed to accept various types of crimping heads, including those that will accept the loose piece die assemblies.

5.5. Power Units

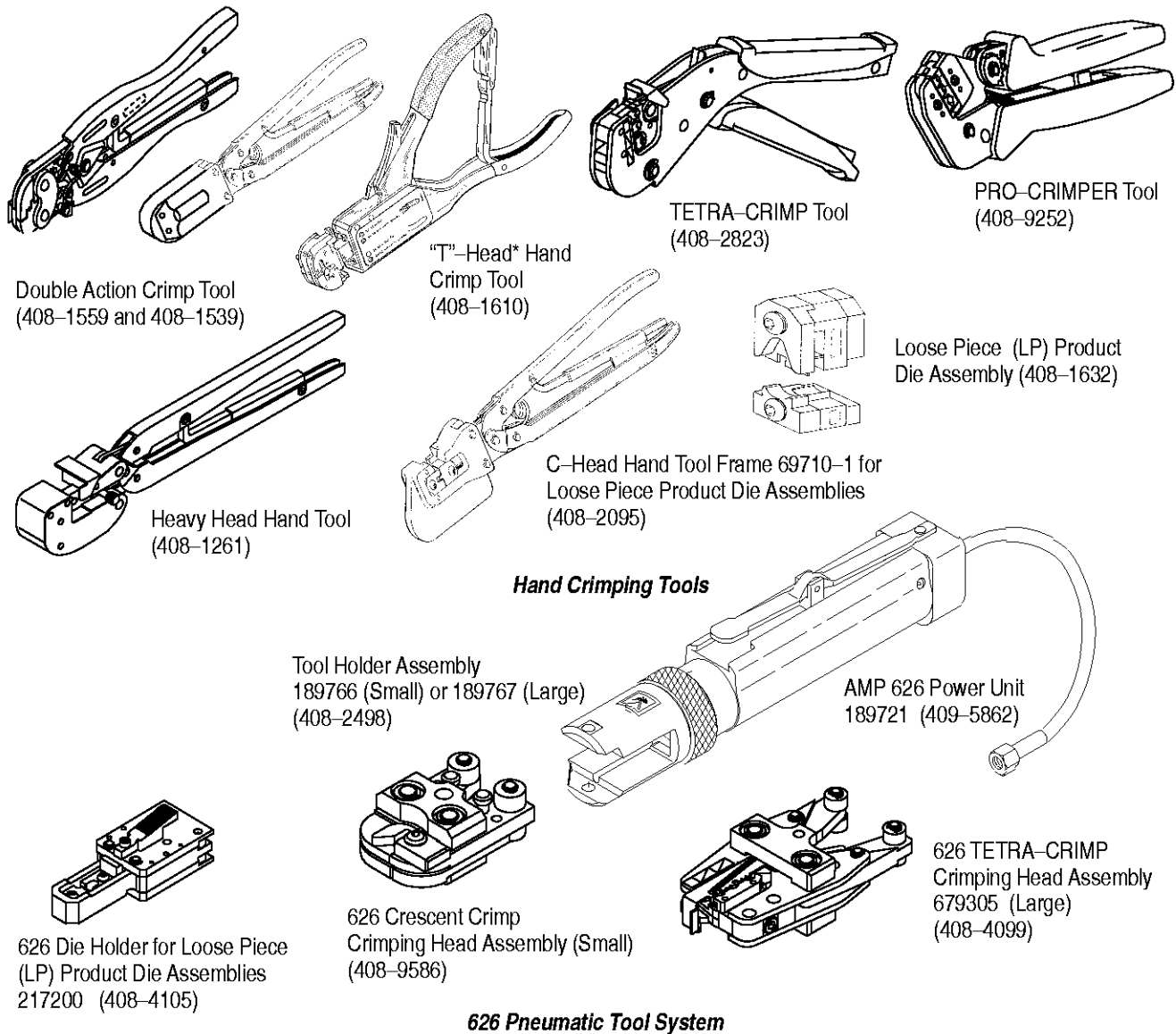
Power units provide the force needed to operate the applicator. There are bench mount-machines and there are stand-alone floor models.

A. Bench-Mounted Machine Power Units

There are AMP-O-ELECTRIC and AUTO-PRO bench-mount machine power units for hand fed wires.

B. Floor Model Machine Power Unit

The AMPOMATOR is a floor model power unit which can be set up to automatically cut the wire to length and terminate it at a high rate of speed.



Hand Crimping Tools

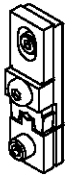
626 Pneumatic Tool System

WIRE SIZE (AWG)	LOOSE PIECE PRODUCT CRIMPING TOOLS						
	HAND CRIMPING TOOLS					LP DIE ASSEMBLY	CRESCENT CRIMP HEAD ASSEMBLY
	DOUBLE ACTION	T-HEAD	TETRA-CRIMP	PRO-CRIMPER	HEAVY HEAD		
26-22	46121	59275	—	—	—	69344	314537-1
22-18	—	59250	—	—	—	—	—
22-16	47386	59250	59824-1	58433-3	—	47806-2	314270-3
16-14 ■	47387	59250	59824-1	58433-3	—	47807-1	314269-1
12-10 and 16-14 ●	—	—	59824-1	58433-3	59239-4 59287-2◇	47808-6 47808-5◇	679305-1●

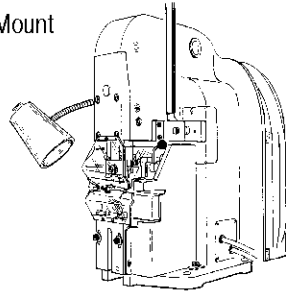
- Terminals with a material thickness of 0.51 to 0.84 [.020 to .033].
- Heavy Duty terminals with a material thickness of 1.02 to 1.27 [.040 -.050].
- ◇ Insulation diameter of 7.62 [.300] maximum.

Figure 9 (cont'd)

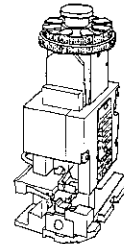
AMP-TAPETRONIC Bench Mount
Machine 69875 (409-1993)



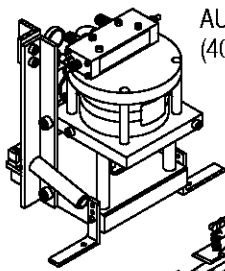
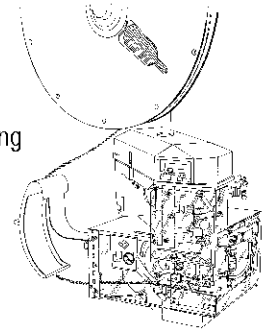
Tape Mounted Die Assembly
(408-2423 or 408-2822)



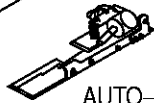
Typical Applicator
(408-8044 or 408-8082)



AMP-O-LECTRIC
Model "G" Terminating
Machine 354500-[]
(409-5842)

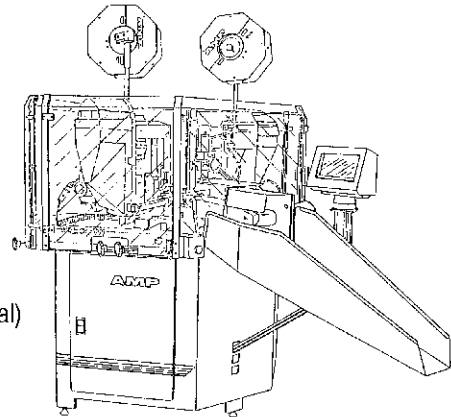


AUTO-PRO Power Unit
(408-9491)



AUTO-PRO Applicator
(408-8088)

AMPOMATOR
CLS IV+ (Typical)
(409-5878)



WIRE SIZE (AWG)	TAPE-MOUNTED PRODUCT CRIMPING TOOLS				
	TM DIE ASSEMBLY	AMP-TAPETRONIC	AMP-O-LECTRIC MODEL "G"	AUTO-PRO	AMPOMATOR
26-22	69877	69875	354500-1 and Applicator 567200-3	818380-1 and Applicator 818057-2	356500-[] and Applicator 687658-1
22-16	69872 or 59826-1				
16-14 ■	69873 59827-1	69875	354500-1 and Applicator 567200-3	818380-1 and Applicator 818057-2	356500-[] and Applicator 687658-1
16-14 ■	69873 59827-1	69875	354500-1 and Applicator 567200-3	818380-1 and Applicator 818057-2	356500-[] and Applicator 687658-1
12-10 and 16-14 ●	69874◇ 59828-1◇ 69897				

- Terminals with a material thickness of 0.51 to 0.84 [.020 to .033].
- Heavy Duty terminals with a material thickness of 1.02 to 1.27 [.040 -.050].
- ◇ Insulation diameter of 7.62 [.300] maximum.

Figure 9 (end)

6. VISUAL AID

The following illustrations show typical installations and are intended for use by production personnel to visually ensure suitable applications. Installations that appear to be incorrect should be inspected using the dimensional information in the preceding pages of this application specification.

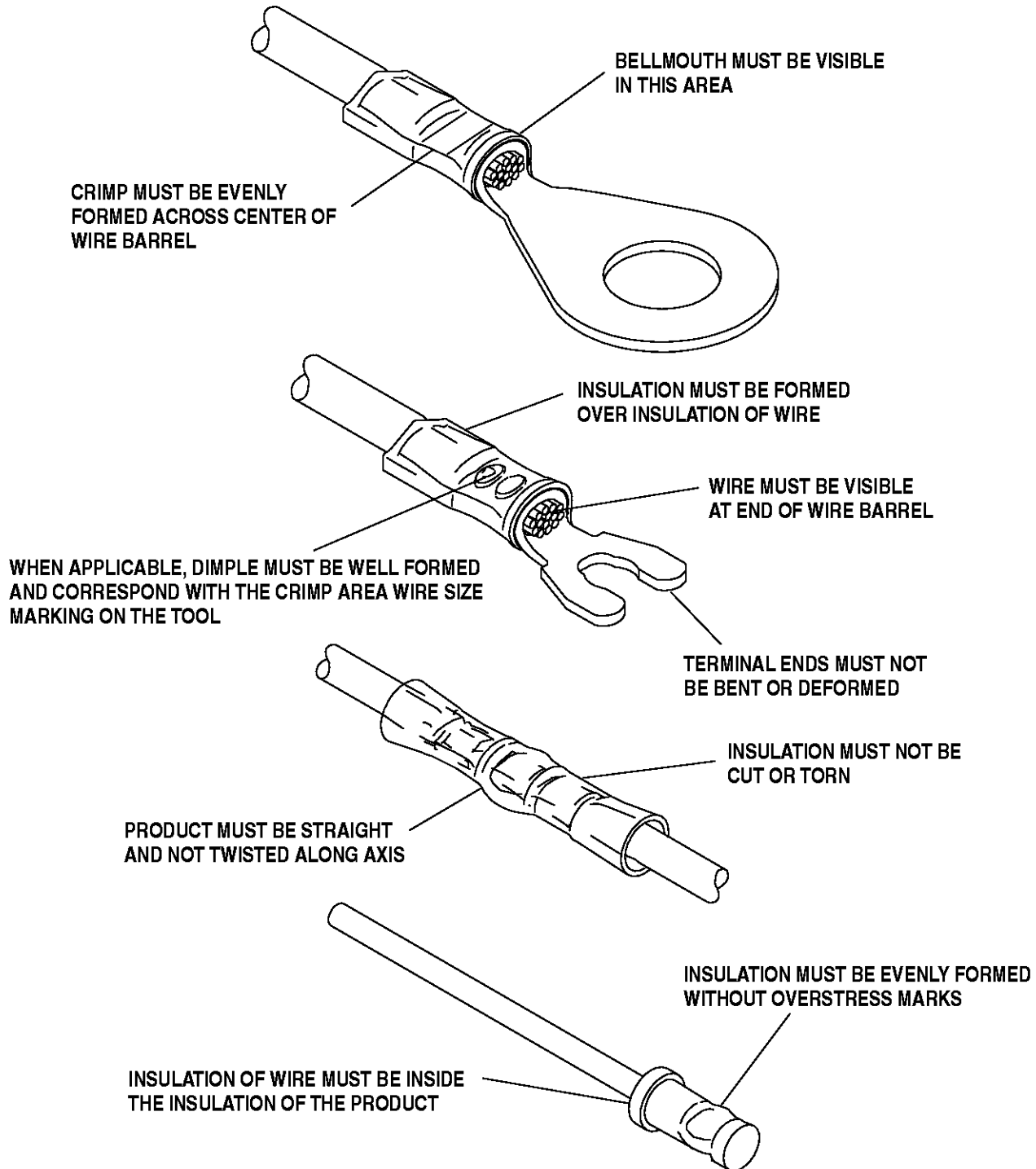


FIGURE 10. VISUAL AID