



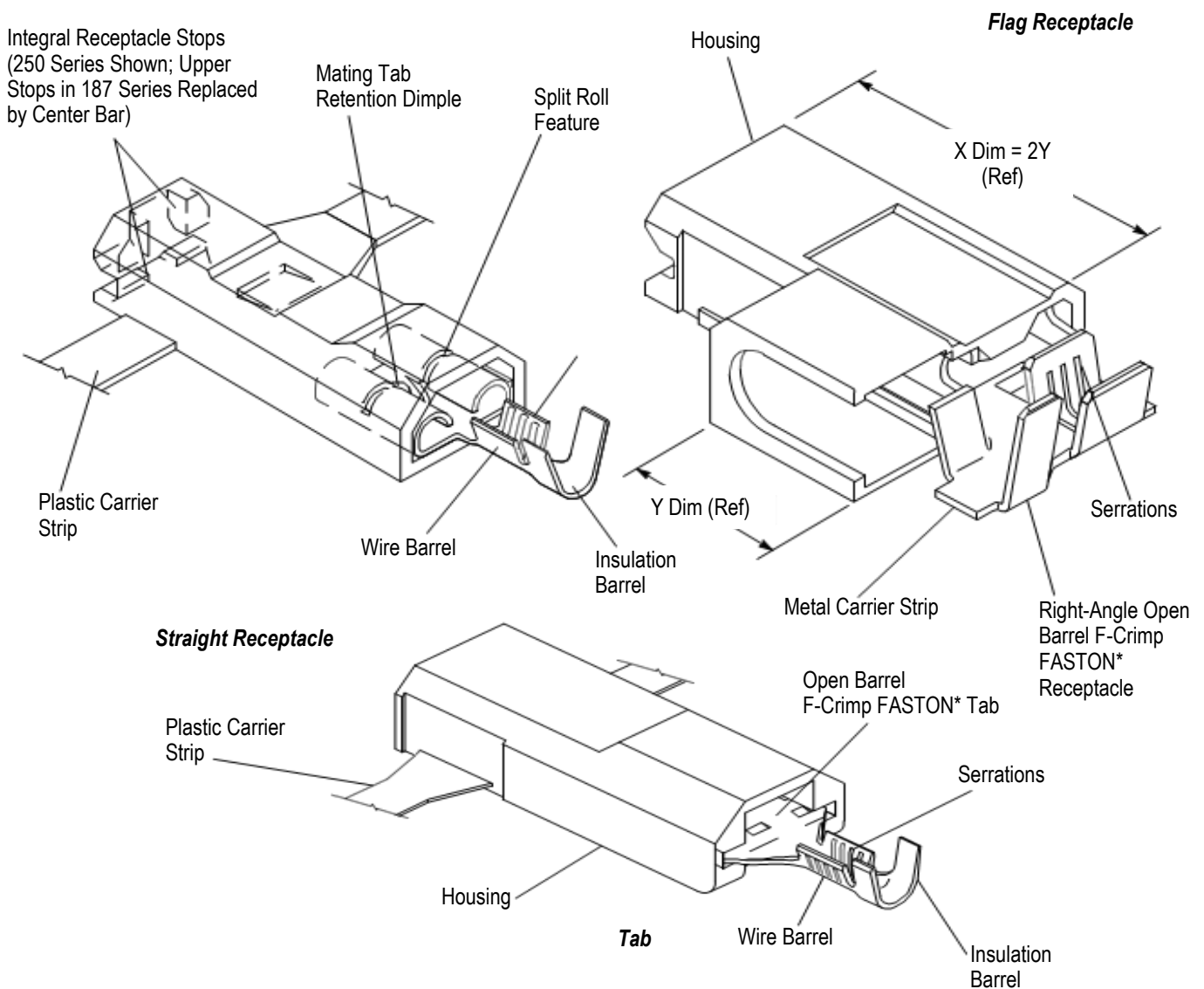
**NOTE**

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 requirements for application of Ultra-Pod FASTON\* Fully Insulated Receptacles and Tabs. The nylon insulated housings on these receptacles provide protection from short circuits and shock hazard. The FASTON\* receptacles they house are designed for use in 600 volt applications and have an operating temperature of  $-40^\circ\text{C}$  to  $105^\circ\text{C}$  [ $-40^\circ\text{F}$  to  $221^\circ\text{F}$ ]. Internal serrations in the F-Crimp wire barrel provide a high level of reliability.

When corresponding with TE Connectivity (TE) Personnel, use the terminology provided in this specification to help 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 covering the most recent additions and changes made to this specification which include the following:

- Corrected drafting error in Figure 4.

### 2.2. Customer Assistance

To ensure consistent and high-quality terminations, TE Connectivity (TE) product engineering has analyzed and tested the design factors of numerous terminal crimp connections with varying wire ranges defined by the terminals. As a result, TE product engineering has defined five criteria necessary to achieve a reliable crimp: be sure to 1) use the TE product only for an application it was designed for, 2) always use the TE recommended application tooling, 3) use an appropriately selected and prepared wire, 4) adhere to the application specification described in the associated TE product print and application documentation (such as the TE 114-Application Specification, and TE Applicator “Log Sheet” print), and 5) have the product handled by trained operators only. TE product performance according to TE product specification can be achieved using the methods described in this application specification with the use of the recommended, properly maintained tooling and applicator.

If tooling or termination equipment is used other than what is recommended by TE, where such tooling or equipment was not used for agency validation and/or the product qualification process, TE does not make any representation or warranty, expressed or implied, and disclaims liability for non-performance per TE product specification. Customer accepts the sole responsibility for the evaluation, application, and use of the terminals in such circumstances.

Reference Part Number 520963 and Product Code 7112 are representative numbers of Ultra-Pod FASTON\* Fully Insulated Receptacles and Tabs. 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 TE Representative or by calling the TE Product Information number at the bottom of page 1.

### 2.3. Drawings

Customer drawings for product part numbers are available from [www.te.com](http://www.te.com). Information contained in the customer drawing takes priority.

### 2.4. Specifications

Product Specification [108-1285](#) covers test data and performance requirements.

### 2.5. Terminal Voltage Rating

Voltage rating is based upon dielectric strength between the terminal and other voltage potential conductors. For these un-insulated terminals, this dielectric strength is determined by 1) the wire insulation used, 2) the housing used (if any), and 3) the application spacings. These appliance business unit terminals with an insulation barrel crimp are designed for UL 1015 wire with insulation rated for 600 volts; so, this is the voltage rating assigned to these terminals. Clearly, if higher dielectric strength wire insulation, larger spacings, and possibly an optional housing are used, larger voltages can be used.

### 2.6. Instructional Material

The following is a list of Instructional Documents (408-series) that provide assembly procedures for product, operation, maintenance and repair of tooling, as well as setup and operation procedures of applicators and Machine Customer Manuals (409-series) that provide setup, operation, and maintenance of machines. Refer to Figure 9 for a complete listing of application equipment and related documents.

- [408-3295](#) Preparing Reel of Contacts for Applicator Tooling
- [408-7424](#) Checking Terminal Crimp Height or Gaging Die Closure
- [408-8053](#) Conversion Guide for Miniature (Mini) and Quick-Change Applicators
- [408-8095](#) Miniature Quick-Change Applicators 852293-[ ] and 853358-[ ]

- 408-8098 Installation Sheet for Ultra-Pod Miniature Quick Change Applicators
- 408-8099 Heavy Duty Miniature Quick-Change Applicator 852500- [ ]
- 408-8102 Installation Sheet for Quick-Change Applicator 852500- [ ]
- 408-9640 Crimp Quality Monitor Applicator for Side-Feed and End-Feed Applications
- 409-9725 250 Series Straight Manual Insertion Tool
- 409-9726 250 Series Straight and Flag Manual Extraction Tool
- 409-9727 250 Series Flag Manual Insertion Tool
- 409-9816 Handling of Reeled Products
- 409-5842 AMP-O-LECTRIC\* Model "G" Terminating Machine 354500-[ ]

### 3. REQUIREMENTS

#### 3.1. Storage

##### A. Ultraviolet Light

Prolonged exposure to ultraviolet light will attack and break down the nylon used in the receptacle housing.

##### B. Reeled Receptacles

When using reeled contacts, store coil wound reels horizontally and traverse wound reels vertically.

##### C. Shelf Life

The contacts should remain in the shipping containers until ready for use to prevent deformation to the contacts. The contacts should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

##### D. Chemical Exposure

Do not store product near any chemical listed below, as stress corrosion cracking may occur.

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 instead of brass if available.

#### 3.2. Wire and Receptacle Selection

##### A. Receptacle Selection

The basic criteria for choosing a receptacle are the width (series) and the thickness of the tab it is to mate with. Contact your local TE Representative for information regarding currently available receptacle choices.

##### B. Wire Selection

Ultra-Pod FASTON\* Fully Insulated Receptacles and Tabs will accept wires with insulation ranges as listed in Figure 2.

Contact	Insulation Range (mm [inch])
250 Series Straight Receptacle	2.29 – 4.57 [.090 – .180]
250 Series Flag Receptacle	1.27 – 4.06 [.050 – .160]
250 Series Tab	3.30 – 5.08 [.130 – .200]
187 Series Straight Receptacle	2.29 – 3.30 [.090 – .130]
187 Series Flag	1.52 – 3.30 [.060 – .130]

110 Series Straight Receptacle	2.03 – 3.05 [.080 – .120]
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**Figure 2**



**NOTE**

For a more specific listing of wire insulation ranges categorized by terminal type, size and wire applied, refer to the table in Figure 4.

**3.3. Wire Preparation**

Strip the wire insulation according to the dimension provided in Figure 3.



**CAUTION**

Care must be taken not to nick, scrape, or cut the wire conductor during the stripping operation.

TERMINAL SERIES NUMBER	WIRE SIZE RANGE (AWG)	STRIP LENGTH ±0.38 [±.015]
250 Straight Receptacle	22 – 18	5.72 [.225]
	18 – 14	
	(2) 18	6.10 [.240]
	14 – 10	6.35 [.250]
250 Flag Receptacle	22 – 18	7.14 [.281]
	18 – 14	
	(2) 18	7.50 [.295]
250 Tab	18 – 14	5.72 [.225]
	12 – 10	
187 Straight Receptacle	20 – 16	4.7 [.185]
	(2) 18	5.10 [.200]
187 Flag Receptacle	22 – 18	5.60 [.220]
	(2) 18	6.00 [.235]
110 Straight Receptacle	22 – 18	4.32 [.170]

**Figure 3**

**3.4. Crimp Requirements**

Locate the terminal to be crimped in the appropriate tooling according to the instructions packaged with that tooling. See Section 5, TOOLING. Perform the crimping operation. Figure 4 shows typical terminals as they should appear after crimping. The table included in Figure 4 lists proper crimp dimensions and tensile strengths, arranged by terminal type and wire criteria.



**CAUTION**

Wire insulation must NOT be cut or broken during the crimping operation. Exercise of reasonable care by tooling operators should be sufficient to provide undamaged terminations. Damaged terminals should not be used. If a damaged product is evident, it should be cut from the wire and replaced with a new one.



**NOTE**

Periodic inspections must be made to ensure crimped contact formation is consistent as shown in Figure 4.

**A. Crimp Height**

The crimp applied to the wire portion of the terminal is the most compressed area and is most critical in ensuring optimum electrical and mechanical performance of the crimped terminal. The crimp height must be within the dimensions provided in Figure 4.

## B. Crimp Length

For optimum crimp effectiveness, the crimp must be within the area shown. Effective crimp length shall be defined as that portion of the wire barrel, excluding bellmouth(s), fully formed by the crimping tool. Instruction for adjusting, repairing, and inspecting tools are packaged with the tools. See Section 5, TOOLING.



### NOTE

*The effective crimp length is given for tooling design only, and should not be used for inspection criteria.*

## C. Bellmouths

Front and rear bellmouths shall be evident and conform to the dimensions given in Figure 4.

## D. Cutoff Tab

The cutoff tab shall be cut to the dimensions shown in Figure 4.

## E. Burrs

The cutoff burr shall not exceed the dimensions shown in Figure 4.

## F. Wire Barrel Flash

The wire barrel flash shall not exceed the dimensions shown in Figure 4 in Section X-X and Y-Y.

## G. Wire Location

After crimping, the wire conductor and insulation must be visible in the transition area between the wire and insulation barrels.

## H. Conductor Location

The conductor may extend beyond the wire barrel to the maximum shown in Figure 4.

## I. Wire Barrel Seam

The wire barrel seam must be closed with no evidence of loose wire stands visible in the seam.

## J. Twist and Roll

There shall be no twist, roll, deformation, or other damage to the mating portion of the crimped contact that will prevent proper mating.

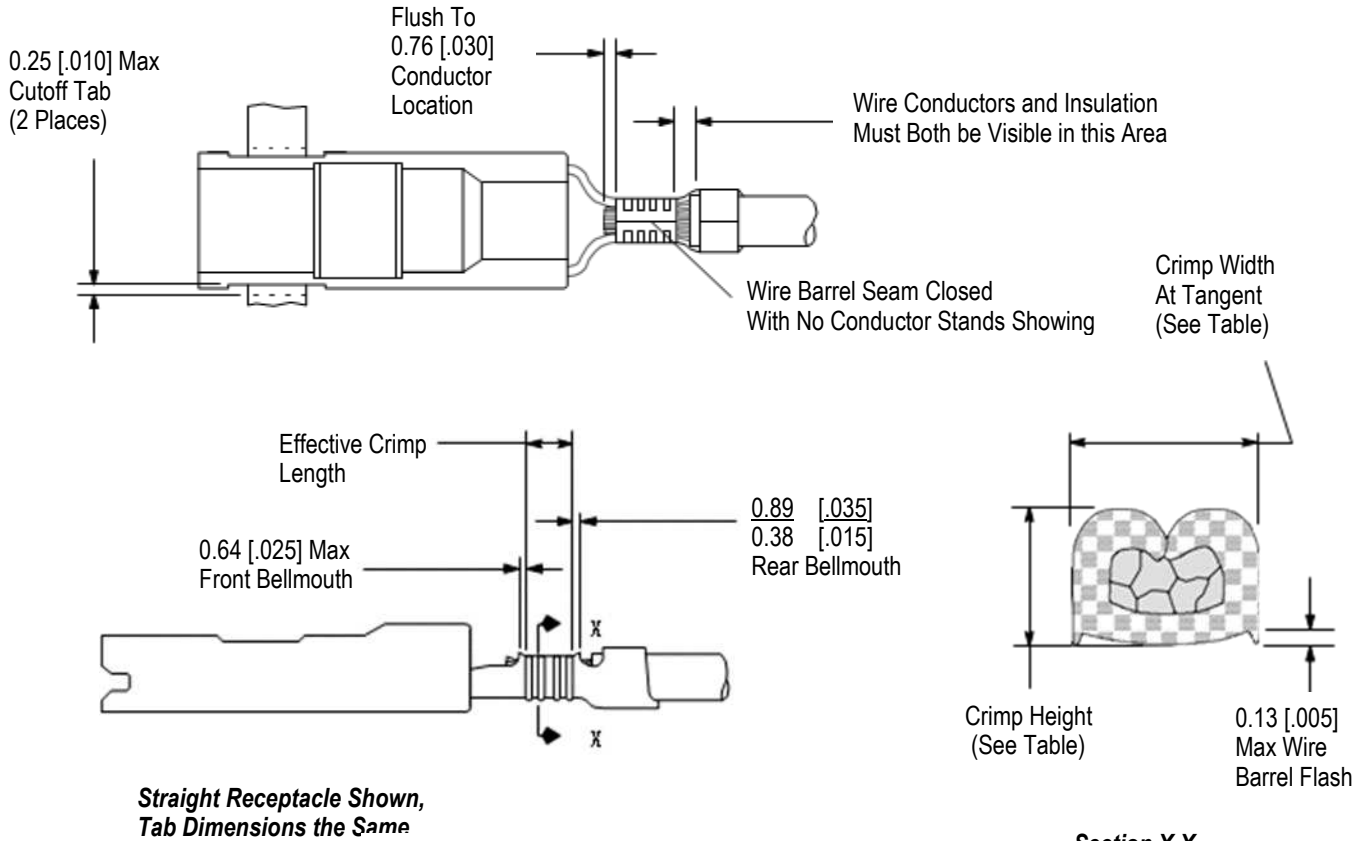
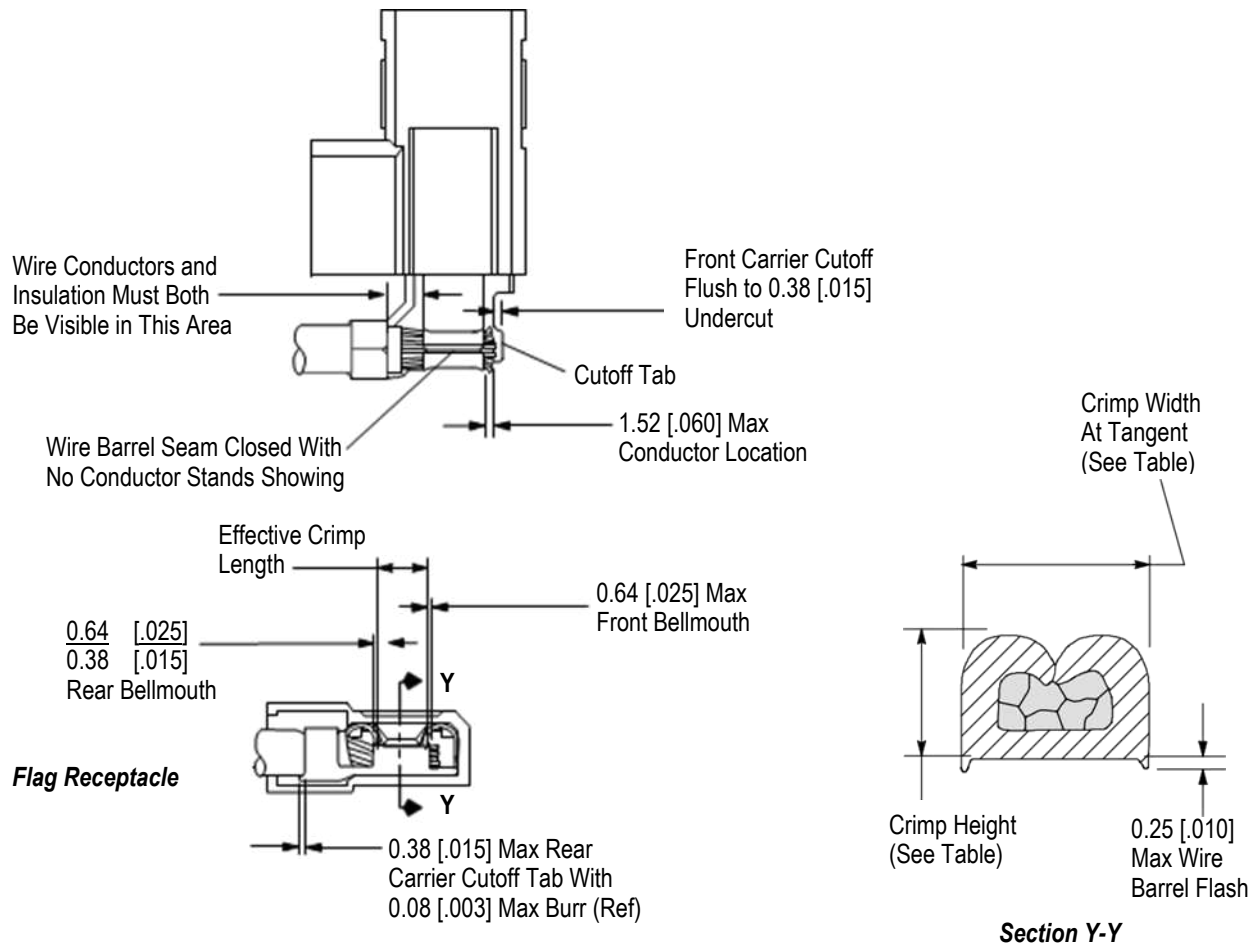


Figure 4 (continued)



TERMINAL WIRE SIZE RANGE [AWG]	INSULATION DIAMETER	QTY	WIRE APPLIED		WIRE BARREL CRIMP		MINIMUM TENSILE STRENGTH (NEWTONS [LBS])
			CMA	REFERENCE SIZE mm <sup>2</sup> [AWG]	WIDTH (REF)	HEIGHT ±0.05 [±.002]	
22-18	2.29-3.3 [.090-.130]	1	700	0.4 [22]	2.29 [.090]	1.24 [.049]	35.6 [8]
		1	1000	0.6 [20]		1.3 [.051]	57.8 [13]
		1	1600	0.8 [18]		1.42 [.056]	89 [20]
		1 ea.	700,1000	0.4 [22], 0.6 [20]		1.45 [.057]	35.6 [8]
		2	700	0.4 [22]		1.37 [.054]	35.6 [8]
18-14	3.05-4.32 [.120-.170]	1	1600	0.8 [18]	2.79 [.110]	1.47 [.058]	89 [20]
		1	2600	1.4 [16]		1.63 [.064]	133.4 [30]
		1	4100	2.0 [14]		1.85 [.073]	222.4 [50]
		1 ea.	700, 1600	0.4 [22], 0.8 [18]		1.57 [.062]	35.6 [8]
		1 ea.	1000, 1600	0.6 [20], 0.8 [18]		1.63 [.064]	57.8 [13]
		2	1600	0.8 [18]		1.73 [.068]	89 [20]
		2	1000	0.6 [20]		1.55 [.061]	57.8 [13]
		1 ea.	1000, 2600	0.6 [20], 1.4 [16]		1.78 [.070]	57.8 [13]
		1 ea.	700, 2600	0.4 [22], 1.4 [16]		1.75 [.069]	35.6 [8]

Figure 4 (continued)

TERMINAL WIRE SIZE RANGE [AWG]	INSULATION DIAMETER	QTY	WIRE APPLIED		WIRE BARREL CRIMP		MINIMUM TENSILE STRENGTH (NEWTONS [LBS])
			CMA	REFERENCE SIZE mm <sup>2</sup> [AWG]	WIDTH (REF)	HEIGHT ±0.05 [±.002]	
14-10	3.30-4.57 [.130-.180]	1	4100	2.0 [14]	3.3 [.130]	2.06 [.081]	222.4 [50]
		1	6500	3.3 [12]		2.36 [.093]	311.4 [70]
		1 ea.	2600, 4100	1.4 [16], 2.0 [14]		2.39 [.094]	133.4 [30]
		1	10,500	5.0 [10]		2.92 [.115]	355.8 [80]
22-18	1.27-2.54 [.050-.100]	1	700	0.4 [22]	2.03 [.080]	1.19 [.047]	35.8 [8]
		1	1000	0.6 [20]		1.27 [.050]	57.8 [13]
		2	700	0.4 [22]		1.32 [.052]	35.6 [8]
		1	1600	0.8 [18]		1.40 [.055]	89 [20]
18-14	2.79-4.06 [.110-.160]	1	1600	0.8 [18]	2.79 [.110]	1.4 [.055]	89 [20]
		1	2600	1.3 [16]		1.55 [.061]	133.4 [30]
		1	4100	2.1 [14]		1.78 [.070]	222.4 [50]
(2) 18	(2) 2.67 [.105] Max.	2	1600	0.8 [18]		1.65 [.065]	89 [20]
(2) 20	(2) 2.67 [.105] Max.	2	1000	0.6 [20]		1.47 [.058]	57.8 [13]
18-14	3.30-4.57 [.130-.180]	1	1600	0.8 [18]	2.79 [.110]	1.47 [.058]	89 [20]
		1	2600	1.4 [16]		1.63 [.064]	133.4 [30]
		1	4100	2.0 [14]		1.85 [.073]	222.4 [50]
		2	1600	0.8 [18]		1.73 [.068]	89 [20]
12-10	3.81-5.08 [.150-.200]	1	6500	3.3 [12]	3.30 [.130]	2.36 [.093]	311.4 [70]
		1	10,500	5.0 [10]		2.92 [.115]	355.8 [80]
20-16	2.29-3.3 [.090-.130]	1	1000	0.6 [20]	2.29 [.090]	1.24 [.049]	57.8 [13]
		1	1600	0.8 [18]		1.35 [.053]	89 [20]
		1	2600	1.3 [16]		1.52 [.060]	133.4 [30]
		1 ea.	1000, 1600	0.6 [20], 0.8 [18]		1.52 [.060]	57.8 [13]
		2	1000	0.6 [20]		1.42 [.056]	57.8 [13]
		1 ea.	700, 1600	0.4 [22], 0.8 [18]		1.47 [.058]	35.6 [8]
		2	700	0.4 [22]		1.3 [.051]	35.6 [8]
		1 ea.	700, 1000	0.4 [22], 0.6 [20]		1.37 [.054]	35.6 [8]
18-16	2.67-5.33 [.105-.210]	1	1600	0.8 [18]	2.79 [.110]	1.35 [.053]	89 [20]
		1	2600	1.3 [16]		1.50 [.059]	133.4 [30]
(2) 18	(2) 2.67 [.105] Max.	2	1600	0.8 [18]		1.60 [.063]	89 [20]
(2) 20	(2) 2.67 [.105] Max.	2	1000	0.6 [20]		1.42 [.056]	57.8 [13]

Figure 4 (continued)



TERMINAL WIRE SIZE RANGE [AWG]	INSULATION DIAMETER	QTY	WIRE APPLIED		WIRE BARREL CRIMP		MINIMUM TENSILE STRENGTH (NEWTONS [LBS])
			CMA	REFERENCE SIZE mm <sup>2</sup> [AWG]	WIDTH (REF)	HEIGHT ±0.05 [±.002]	
22-18	1.50-2.80 [.060-.110]	1	700	0.4 [22]	1.78 [.070]	1.09 [.043]	35.6 [8]
		1	1000	0.6 [20]		1.19 [.047]	57.8 [13]
		1	1600	0.8 [18]		1.32 [.052]	89 [20]
18-14	2.67-3.56 [.105-.140]	1	1600	0.8 [18]	2.79 [.110]	1.27 [.050]	89 [20]
		1	2600	1.4 [16]		1.42 [.056]	133.4 [30]
		1	4100	2.1 [14]		1.65 [.065]	222.4 [50]
(2) 18	(2) 2.67 [.105] Max.	2	1600	0.8 [18]		1.52 [.060]	89 [20]
22-18	2.03-3.05 [.080-.120]	1	700	0.4 [22]	1.57 [.062]	1.02 [.040]	35.6 [8]
		1	1000	0.6 [20]		1.09 [.043]	57.8 [13]
		1	1600	0.8 [18]		1.24 [.049]	89 [20]

Figure 4 (end)

### 3.5. Straightness

#### A. Terminal Alignment

The crimped terminal shall not be deformed or damaged in a manner preventing full insertion into its housing. There shall be no twist or roll in the contact portion of the terminal that will prevent it from mating properly.

#### B. Housing Retention

Terminals must be straight within the limits shown in Figure 5. When seated in housing, the terminal must bottom against insertion stops. Test for proper seating by pulling lightly in a direction opposite insertion.

**Straightness of Terminals Prior to Pod Insertion**

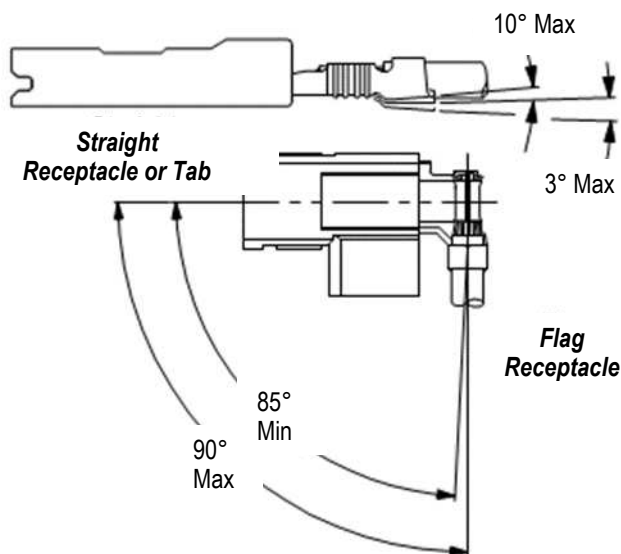
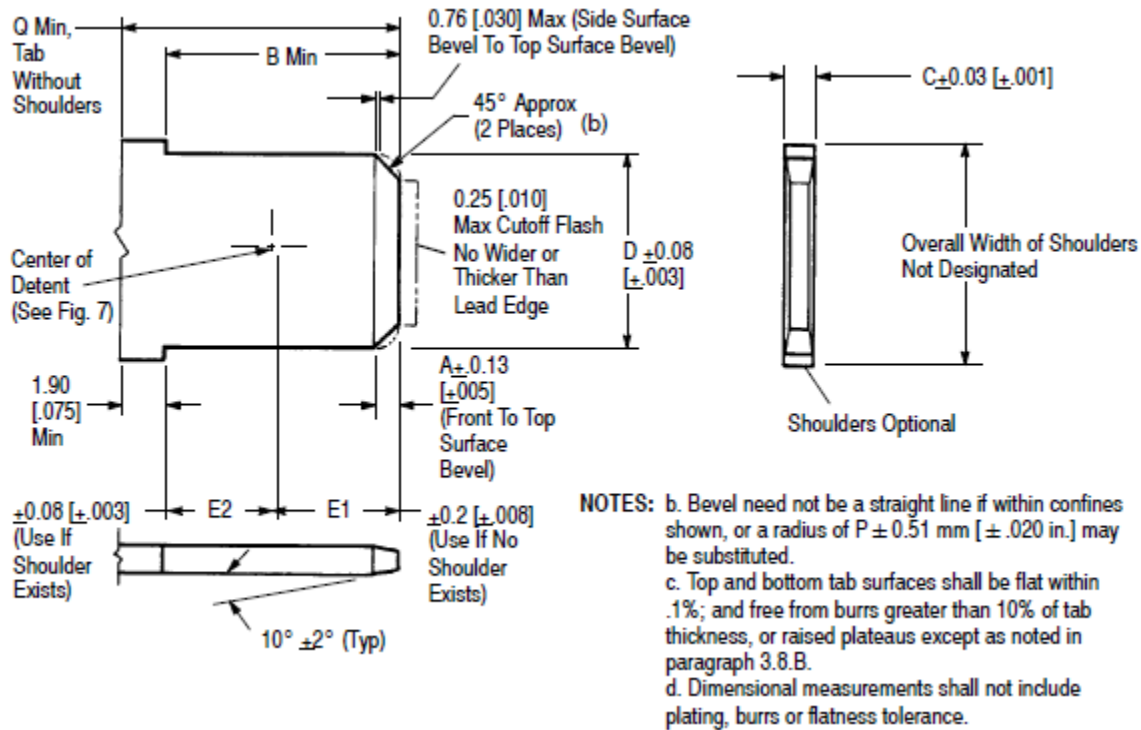


Figure 5

### 3.6. Mating Tab Dimensions

Figure 6 shows features and dimensional requirements for tab terminals intended for mating with Ultra-Pod FASTON® Fully Insulated Receptacles.



TAB SIZE (NOMINAL)	DIMENSION							
	A	B	C	D	E1	E2	P	Q
6.35x0.81 [.250x.032] With Dimple	0.89 [.035]	7.8 [.307]	0.81 [.032]	6.35 [.250]	3.86 [.152]	4.06 [.160]	1.27 [.050]	10.00 [.394]
6.35x0.81 [.250x.032] With Hole	0.89 [.035]	7.8 [.307]	0.81 [.032]	6.35 [.250]	4.52 [.178]	3.40 [.134]	1.27 [.050]	10.00 [.394]
4.75x0.81 [.187x.032] With Dimple	0.89 [.035]	6.22 [.245]	0.81 [.032]	4.75 [.187]	2.54 [.100]	3.81 [.150]	1.27 [.050]	8.90 [.350]
4.75x0.81 [.187x.032] With Hole	0.89 [.035]	6.22 [.245]	0.81 [.032]	4.75 [.187]	3.18 [.125]	3.18 [.125]	1.27 [.050]	8.90 [.350]
4.75x0.51 [.187x.020] With Dimple	0.76 [.030]	6.22 [.245]	0.51 [.020]	4.75 [.187]	2.54 [.100]	3.81 [.150]	1.14 [.045]	8.90 [.350]
4.75x0.51 [.187x.020] With Hole	0.76 [.030]	6.22 [.245]	0.51 [.020]	4.75 [.187]	3.18 [.125]	3.18 [.125]	1.14 [.045]	8.90 [.350]
2.79x0.51 [.110x.020] With Dimple or Hole	0.51 [.020]	6.98 [.275]	0.51 [.020]	2.79 [.110]	1.57 [.062]	5.54 [.218]	0.89 [.035]	8.13 [.320]

Figure 6

### 3.7. Tab Retention and Detent Configuration

A tab configuration having no locking feature may be used for applications where low mating retention forces are desirable. Where higher forces are sought, a tab with a detent meeting the requirements of Figure 7 should be used. Hole detents provide the greatest retention forces, while dimples provide acceptable medium-range forces.

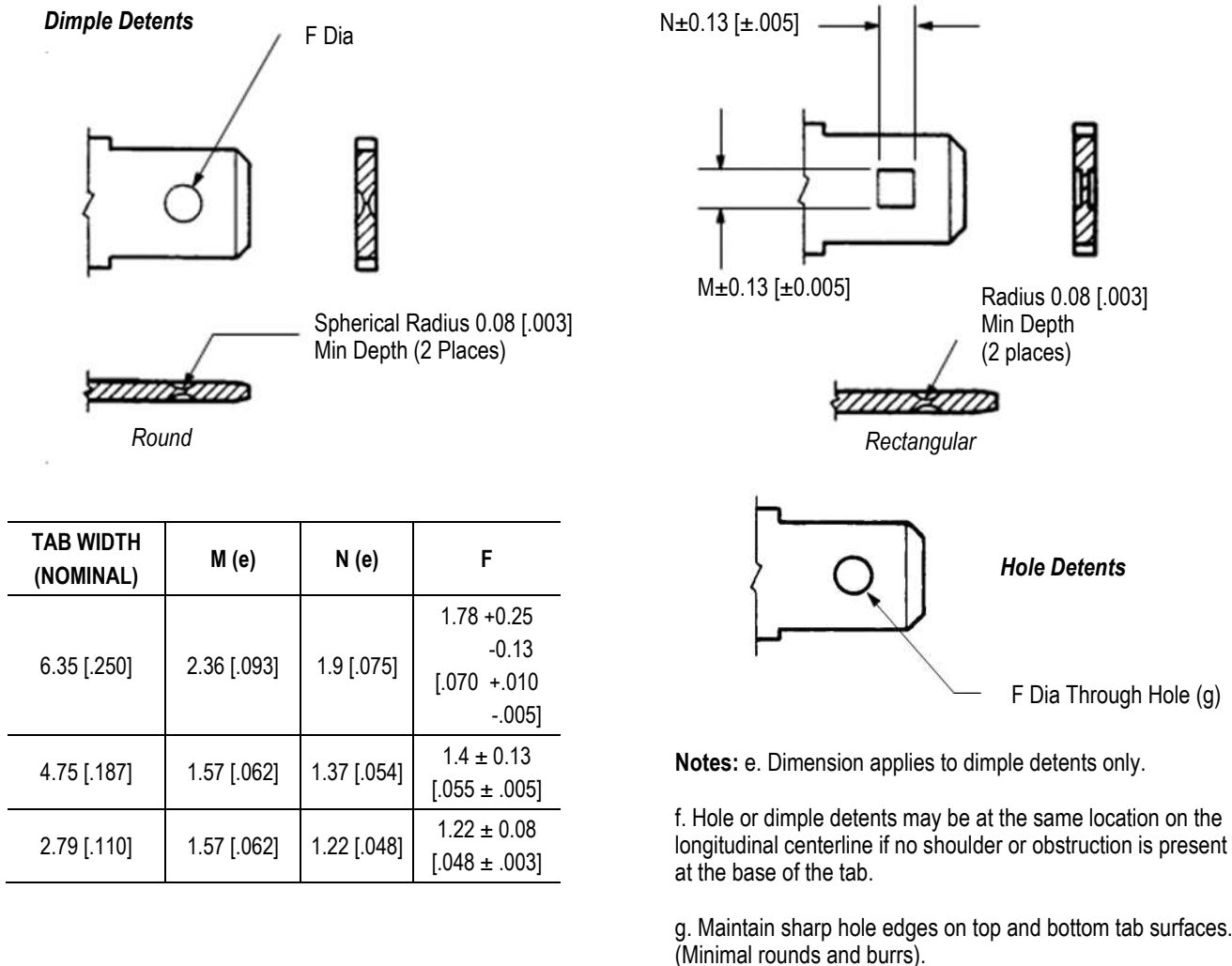


Figure 7

### 3.8. Mating Over Cycle and Testing

#### A. Mating/Unmating Cycles

The rolled shape of the Ultra-Pod FASTON\* Fully Insulated Receptacles and Tabs determines the contact mating force. This design is NOT intended for a high number of mating cycles over the life of the product. Therefore, the maximum number of mating cycles (matings/unmatings) recommended is six (6).

## 4. QUALIFICATION

Ultra-Pod FASTON\* Fully Insulated Receptacles and Tabs are supported by the following commercial, military and government qualification and specification organizations.

#### 4.1. Underwriters Laboratories Inc. (UL)

Products meet UL-310 specification for quick-connect terminals and are Listed in UL Component Listing Program — Electrical File No. E-66717.



**NOTE**

UL does not qualify this type of terminal when designed for application to 24 AWG or smaller wire.

#### 4.2. CSA International

CSA Certified in File No. LR7189.

### 5. TOOLING

Application tooling crimps receptacle, then inserts it into its housing. In order to check crimp measurements, the toggle valve switch on the applicator must be properly positioned so that insertion will not automatically take place. Refer to the applicator instruction sheet packaged with the applicator for instructions. After checking measurements, use the appropriate insertion tool, listed in Figure 8, to manually insert the receptacle into its housing. Manual extraction tools are also listed.



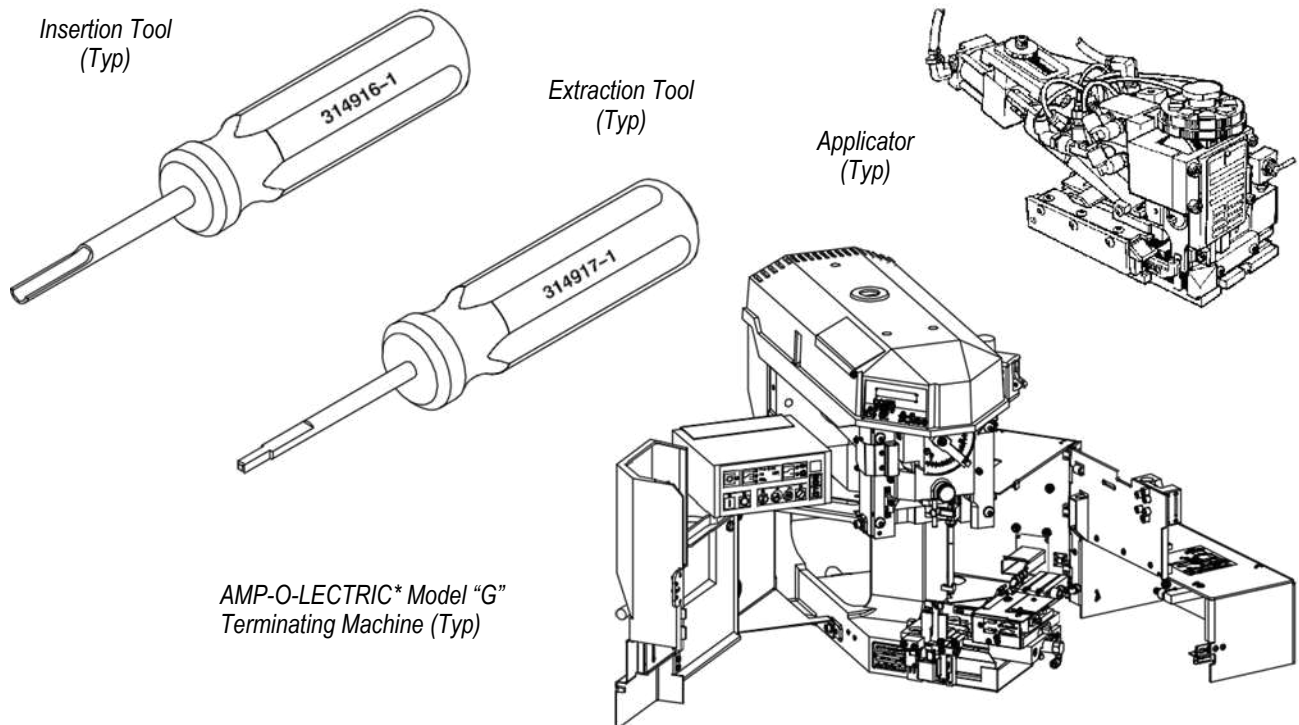
**NOTE**

Lift up on the rear of the crimped receptacle when inserting it into its housing. This enables it to slide fully past the internal retention feature of the housing (maximum 12-lb insertion force).

Terminal Type	Insertion Tool	Extraction Tool
250 Series Straight	314916-1 (408-9725)	314917-1 (408-9726)
250 Series Flag	314919-1 (408-9727)	314917-1 (408-9726)

**Figure 8**

Product is applied using automatic tooling only. Contact the Product Information number listed at the bottom of page 1 for applicator information about product offerings not currently covered in the table. See Figure 9.



RECEPTACLE TYPE	WIRE SIZE RANGE (AWG)	HDM APPLICATOR (DOCUMENT)	POWER UNIT PART NUMBER (DOCUMENT)	POWER UNIT TYPE
250 Series Straight Receptacle	22-18	853741-3 (408-8095)	354500-[ ] (408-5842)	Model "G"
	18-14	852293-3 (408-8095)		
		680879-3 (408-8095) (Positive Lock)		
	(2) 18 (2) 20	1385719-3 (408-8095)		
14-10	680017-3 (408-8095)			
250 Series Flag Receptacle	22-18	680020-1 (408-8099)		
	18-14	852500-3 (408-8099)		
	(2) 18 (2) 20	1385813-3 (408-8099)		
250 Series Tab	18-14	680834-3 (408-8095)		
	12-10	1395303-1 (408-8095)		
187 Series Straight Receptacle	20-16	853358-3 (408-8095)		
	18-14	680878-3 (408-8095) (Positive Lock)		
		(2) 18 (2) 20		
187 Series Flag Receptacle	22-18	1385725-3 (408-8099)		
	(2) 18 (2) 20	1385724-3 (408-8099)		
110 Series Straight Receptacle	22-18	680835-1 (408-8095)		


**NOTE**

Tooling information listed above applies to Bench Machine Model "G" only. For additional applicator and machine options, contact the Product Information Center number at the bottom of page 1.

**Figure 9**

### 6. VISUAL AID

Figure 0 is to be used by production personnel to ensure a properly applied product. Sample receptacles are shown as they should appear for best quality termination. Applications which are NOT visually correct should be inspected using the information in the main body of this specification and in the instructional material shipped with the product or tool.

**NOTE:** RECEPTACLES SHOWN, TAB TERMINATION SHOULD BE THE SAME.

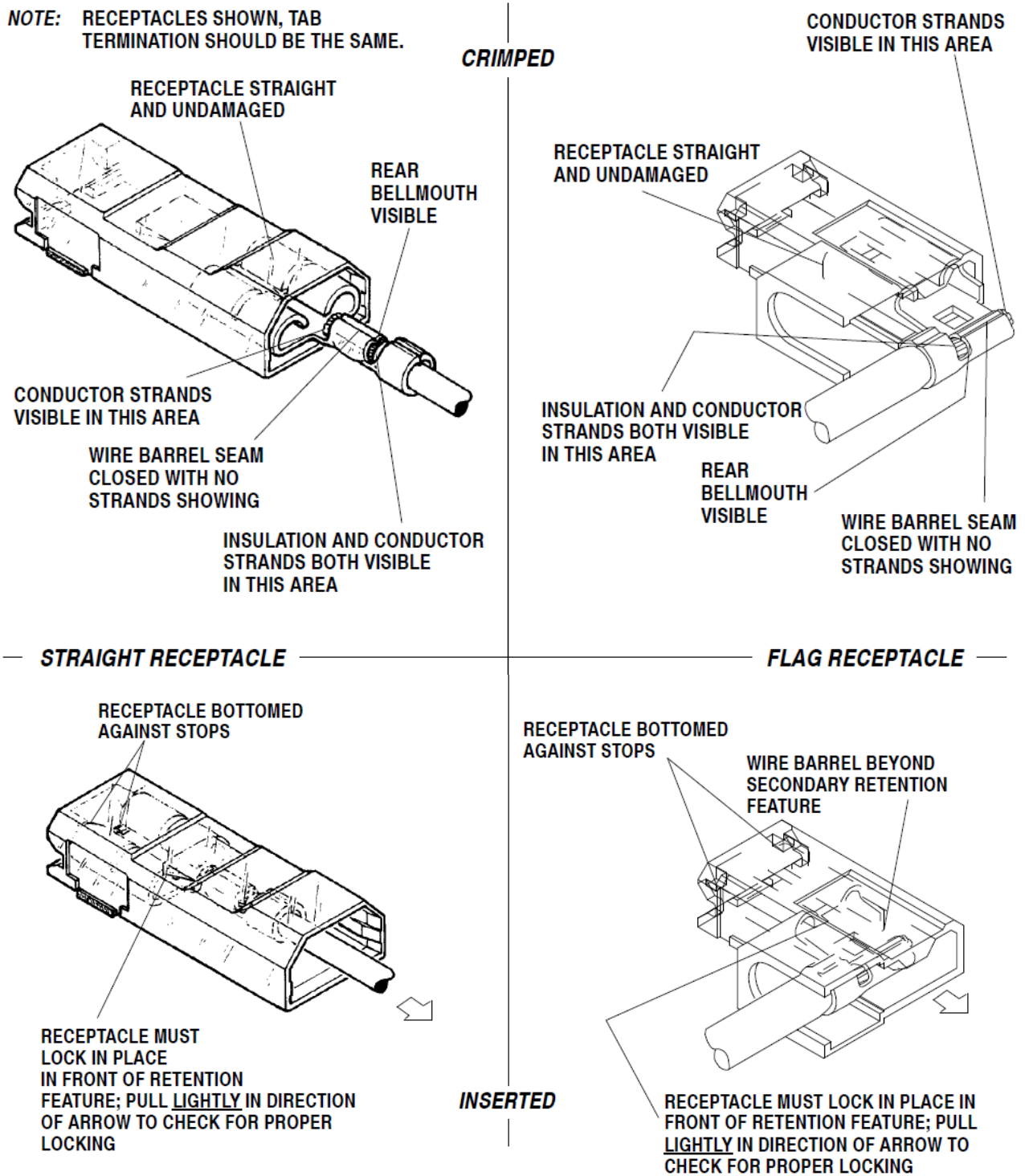


Figure 10