

**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 PIDG FASTON receptacle contacts. The contacts are available in Series 250 (6.35 mm [.250 in.]), 205 (5.21 mm [.205 in.]), 187 (4.75 mm [.187 in.]), and 110 (2.79 mm [.110 in.]). The series designator corresponds to the width of the contact mating end (in thousands of an inch). The contact insulation is color coded to provide a visual reference applicable to the wire size range suitable for the contact. The serrations inside the wire barrel provide maximum contact and tensile strength after crimping. These contacts are available in loose-piece for terminating with manual hand-held tools, and in tape-mounted or reel-mounted form for terminating with machines.

The contacts accept mating tabs in Series 250 (6.35 mm [.250 in.]), 205 (5.21 mm [.205 in.]), 187 (4.75 mm [.187 in.]), and 110 (2.79 mm [.110 in.]). The series designator corresponds to the width of the tab mating end (in thousands of an inch).

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.

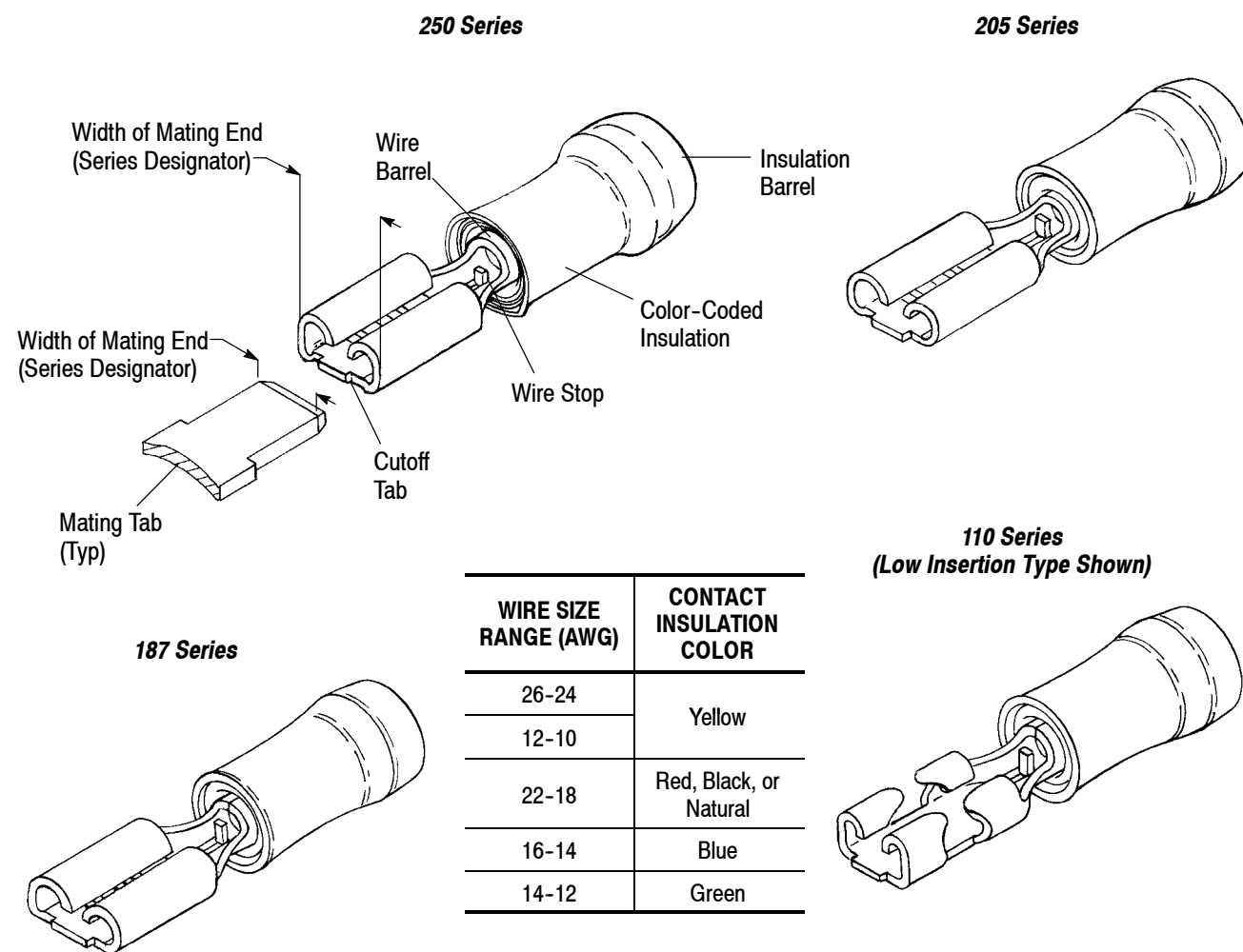


Figure 1

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## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

Revisions to this application specification per EC 0990-1188-02 include:

- Updated document to corporate requirements
- New logo and format

### 2.2. Customer Assistance

Reference Product Part Number 640903 and Product Code 1164 are representative of PIDG FASTON receptacle contacts. 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 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. Specifications

Product Specification 108-1033 provides product performance and test information.

### 2.5. Instructional Material

Instruction Sheets (408-series) provide product assembly instructions or tooling setup and operation procedures and Customer Manuals (409-series) provide machine setup and operation procedures. Documents available which pertain to this product are:

408-1559	Hand Crimping Tool 48518-2
408-2423	Crimping Die Assembly 69877-2
408-2822	Crimping Die Assemblies 59826-1, 59827-1, and 59828-1
408-2823	TETRA-CRIMP* Hand Crimping Tool 59824-1
408-3295	Preparing Reel of Contacts for Application Tooling
408-7278	Hand Crimping Tool 90185-1
408-7424	Checking Terminal Crimp Height Gaging Die Closure
408-7426	Hand Crimping Tool 90246-1
408-7563	Crimping Die Assemblies 90240-2 and 90248-2
408-7903	Hand Crimping Tool 90276-2
408-8040	Heavy Duty Miniature Quick-Change Applicators (Side-Feed Type) with Mechanical Feed System
408-8044	Miniature Quick-Change Applicator for Tape-Mounted Closed Barrel Terminals
408-8063	TETRA-CRIMP Heavy-Duty Miniature Quick-Change Applicators (Side-Feed Type) with Air Feed for FASTON Terminals
408-8082	Miniature Quick-Change Applicators (Side-Feed Type) With Air Feed for Tape-Mounted PIDG Terminals
408-9816	Handling of Reeled Products
409-1993	AMP-TAPETRONIC* Machine 69875
409-5128	AMP-O-LECTRIC* Model "K" Terminating Machine 565435-5
409-5842	AMP-O-LECTRIC Model "G" Terminating Machine 354500-[ ]
409-5852	AMPOMATOR* CLS III-G Lead-Making Machine 122500-[ ]
409-5866	AMPOMATOR CLS IV Lead-Making Machine 217500-[ ]
409-5878	AMPOMATOR CLS IV+ Lead-Making Machine 356500-[ ]
409-10016	Entry Level Terminator (ELT) Machine 1338600-[ ]

## 3. REQUIREMENTS

### 3.1. Storage

#### A. Ultraviolet Light

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

### B. Reel Storage

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 contact. The contacts 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 contacts near any chemicals listed below as they may cause stress corrosion cracking in the contacts.

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

#### NOTE

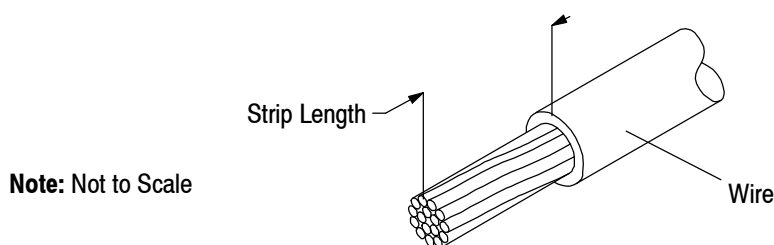


Where the above environmental conditions exist, phosphor-bronze contacts are recommended instead of brass contacts.

### 3.2. Wire Selection and Preparation

The contacts will accept solid or stranded copper wire sizes 26 through 10 AWG with an insulation diameter range of 1.02 through 6.35 mm [.040 through .250 in.].

Proper strip length is necessary to properly insert the wire into the contact. Reasonable care must be taken not to nick, scrape, or cut any part of the wire during the stripping operation. The strip length of the wire is shown in Figure 2.



CONTACT		WIRE		
SERIES	COLOR CODE	SIZE RANGE (AWG)	INSULATION DIAMETER RANGE	STRIP LENGTH $\pm 0.41$ [.016]
110	Yellow	26-24	1.27-2.08 [.050-.082]	6.76 [.266]
	Black or Natural	22-18	1.02-2.79 [.040-.110]	5.16 [.203]
	Red		2.67-3.56 [.105-.140]	7.92 [.312]
	Blue	16-14	2.92-4.32 [.115-.170]	7.92 [.312]
187	Yellow	26-24	1.27-2.08 [.050-.082]	5.16 [.203]
	Red	22-18	2.67-3.56 [.105-.140]	7.92 [.312]
	Blue	16-14	2.92-4.32 [.115-.170]	
205	Red	22-18	2.67-3.56 [.105-.140]	7.92 [.312]
	Blue	16-14	2.92-4.32 [.115-.170]	
250	Red	22-18	2.62-3.56 [.105-.140]	7.92 [.312]
	Blue	16-14	2.92-4.32 [.115-.170]	7.92 [.312]
	Green	14-12	3.81-6.35 [.150-.250]	8.74 [.344]
	Yellow	12-10	3.81-6.35 [.150-.250]	8.74 [.344]

Figure 2

### 3.3. Crimp Requirements

#### NOTE

Periodic inspections must be made to ensure crimped contact formation is consistent as shown in Figure 3.



#### A. Conductor Location

The wire conductors must be located between the contact wire stop and wire barrel. See Figure 3.

#### B. Cutoff Tab and Burr

Cutoff tabs are the remaining portion of the carrier strip after the contact is cut from the strip. The following dimensional requirements will ensure proper application for these contacts.

1. The cutoff tab must not exceed the dimension shown in Figure 3.
2. There shall be no burr resulting from the cutoff tab shearing.

#### C. Wire Barrel and Insulation Barrel Crimp

The crimped area must be symmetrical on both sides of the wire barrel and insulation barrel of contact. The crimp may be off center but not off the end of the wire barrel or insulation barrel. All wire conductors must be held firmly inside the wire barrel. No strands can be folded back over the wire insulation. The insulation of the contact must not be deformed, cut, or show stress marks. See Figure 3.

#### D. Crimp Height

Because these contacts are insulated, crimp height readings cannot be measured over the insulation. Therefore, to check for proper crimp height, a piece of solid-core solder must be crimped. Solder with a ratio of 60% tin to 40% lead is recommended. Diameter of the solder must be as stated in Figure 3.

The height of the crimped solder must be checked against the crimp height dimensions stated in the instructional material shipped with the application tooling. Gaging procedures are described in Instruction Sheet 408-7424.

#### CAUTION



Solder must not be used in tools that crimp non-insulated contacts, unless specified by engineering (solder particles could jam tooling locators, wire stops, ejectors, etc.).

#### CAUTION



Crimp height dimensions must not be applied directly to the contact. Applying crimp height dimensions directly to the contact will over-crimp the contact, cracking the wire barrel, and possibly causing damage to the tooling.

#### E. Bellmouths

The front and rear bellmouths shall be evident as shown in Figure 3.

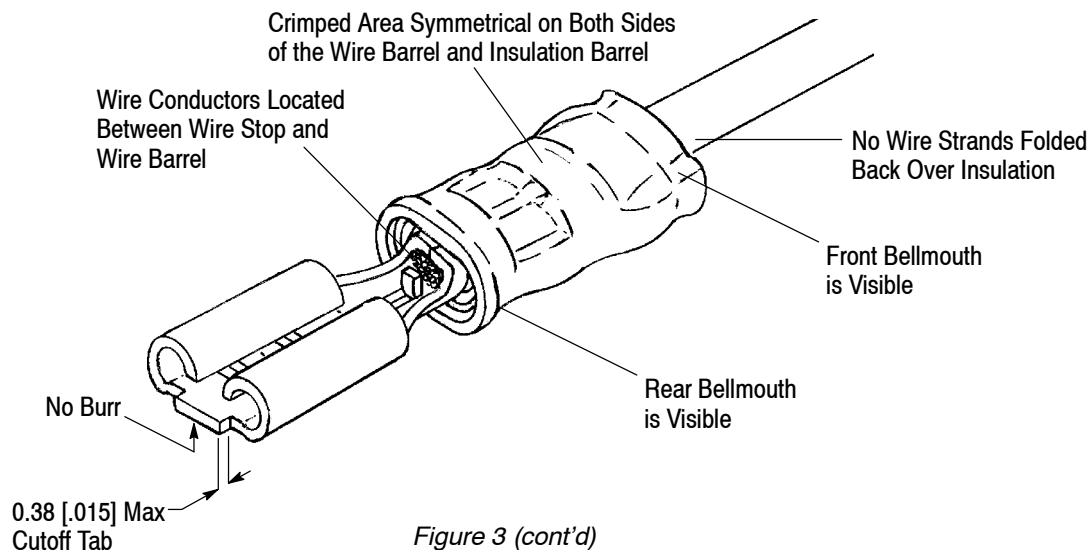


Figure 3 (cont'd)

CRIMP HEIGHT INSPECTION	
WIRE SIZE RANGE (AWG)	SOLDER DIAMETER
26-18	3.18 [.125] [ $\frac{1}{8}$ ]
16-14	4.76 [.1875] [ $\frac{3}{16}$ ]
14-10	6.35 [.250] [ $\frac{1}{4}$ ]

Figure 3 (end)

**F. Straightness**

There shall be no twist, roll, deformation, or other damage to the mating portion of the crimped contact that will prevent proper mating. See Figure 4.

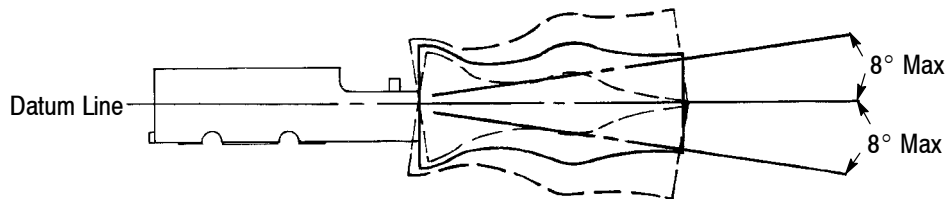


Figure 4

**G. Tensile Inspection**

Crimped contacts should hold the wire firmly and have a pull-test tensile value specified in Figure 5.

**NOTE**

Tensile testing machine should be adjusted for head travel of 25.4 mm [1.0 in.] per minute. Force should be applied directly and gradually for 1 minute.

WIRE SIZE (AWG)	CRIMP PULL-OUT TEST MINIMUM FORCE (N [lbs])
26	13.3 [3]
24	22.2 [5]
22	35.6 [8]
20	57.8 [13]
18	89 [20]
16	133.4 [30]
14	222.4 [50]
12	311.4 [70]
10	355.9 [80]

Figure 5

**3.4. Mating Tab****A. Dimensions**

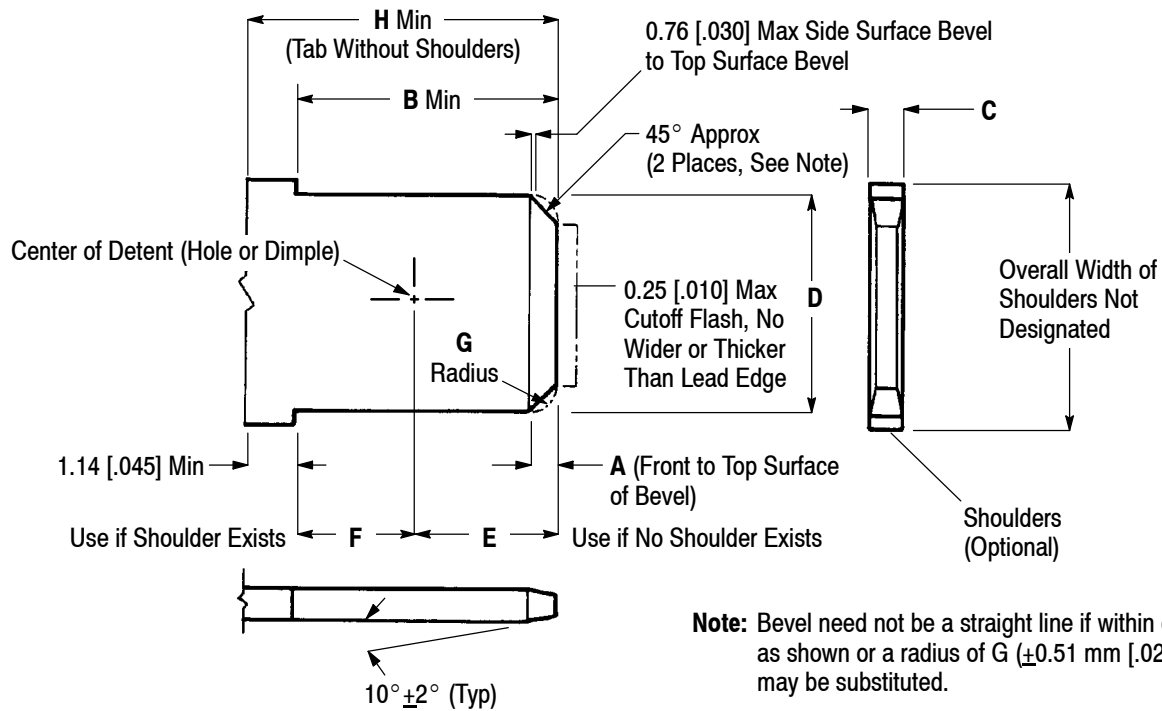
Features and dimensional requirements for tabs intended for mating with these contacts are shown in Figure 6.

**NOTE**

Dimensional measurements shall not include plating, burrs, or flatness tolerance.

**NOTE**

Top and bottom tab surfaces shall be flat within .1% and free from burrs greater than 10% of tab thickness, or raised plateaus except as noted in Section 3.3, C, Testing.



MATING TAB	DIMENSION							
	A $\pm 0.13$ [.005]	B (Min)	C $\pm 0.03$ [.001]	D $\pm 0.08$ [.003]	E $\pm 0.20$ [.008]	F $\pm 0.08$ [.003]	G $\pm 0.51$ [.020]	H (Min)
6.35 × 0.81 [.250 × .032] With Dimple	0.89 [.035]	7.8 [.307]	0.81 [.032]	6.35 [.250]	3.86 [.152]	4.06 [.160]	1.27 [.050]	8.94 [.352]
6.35 × 0.81 [.125 × .032] With Hole	0.89 [.035]	7.8 [.307]	0.81 [.032]	6.35 [.250]	4.52 [.178]	3.4 [.134]	1.27 [.050]	8.94 [.352]
5.21 × 0.81 [.205 × .032] With Hole	0.89 [.035]	6.22 [.245]	0.51 [.020]	5.26 [.207]	3.18 [.125]	3.18 [.125]	1.14 [.045]	7.37 [.290]
5.21 × 0.81 [.205 × .032] With Dimple	0.89 [.035]	6.22 [.245]	0.81 [.032]	5.26 [.207]	2.54 [.100]	3.81 [.150]	1.27 [.050]	7.37 [.290]
5.21 × 0.51 [.205 × .020] With Hole	0.89 [.035]	6.22 [.245]	0.81 [.032]	5.26 [.207]	3.18 [.125]	3.18 [.125]	1.27 [.050]	7.37 [.290]
4.75 × 0.51 [.187 × .020] With Dimple	0.76 [.030]	6.22 [.245]	0.51 [.020]	4.75 [.187]	2.54 [.100]	3.81 [.150]	1.14 [.045]	7.37 [.290]
4.75 × 0.51 [.187 × .020] With Hole	0.76 [.030]	6.22 [.245]	0.51 [.020]	4.75 [.187]	3.18 [.125]	3.81 [.150]	1.14 [.045]	7.37 [.290]
2.79 × 0.81 [.110 × .032] With Dimple or Hole	0.51 [.020]	6.98 [.275]	0.81 [.032]	2.79 [.110]	1.57 [.062]	5.54 [.218]	0.89 [.035]	8.13 [.320]
2.79 × 0.51 [.110 × .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

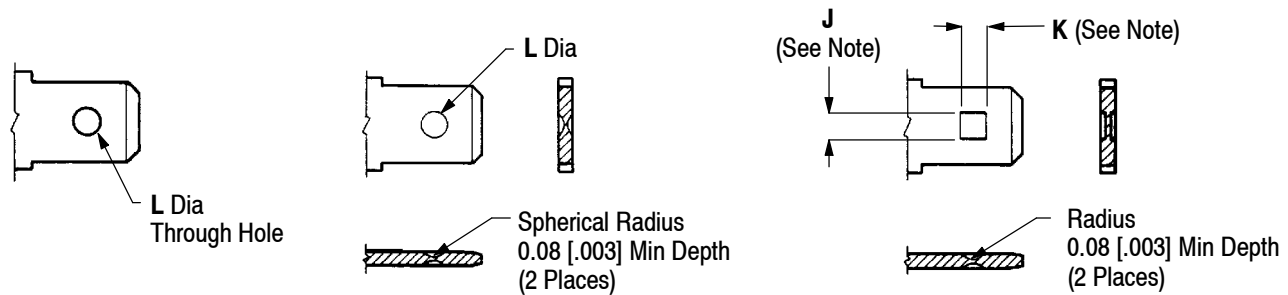
## B. Retention and Detent (Hole and Dimple) Configurations

A tab configuration having no locking feature may be used for applications where low mating retention forces are desirable. Holes provide the greatest retention forces and dimples provide acceptable medium-range forces. Where higher forces are sought, a tab hole should meet the requirements shown in Figure 7.

### NOTE



Hole or dimple detents may be at the same location on the longitudinal centerline if no shoulder or obstruction is present at the base of the tab.



**Note:** Dimension applies to dimple detents only.

MATING TAB SERIES	DIMENSION		
	J $\pm 0.13$ [ $\pm .005$ ]	K $\pm 0.13$ [ $\pm .005$ ]	L (Dia)
250	2.36 [.093]	1.9 [.075]	$1.78 + 0.25 / - 0.13$ [.070 + .010 / -.005]
205	2.36 [.093]	1.9 [.075]	$1.78 + 0.25 / - 0.13$ [.070 + .010 / -.005]
187	1.57 [.062]	1.37 [.054]	$1.4 \pm 0.13$ [.055 $\pm$ .005]
110	1.57 [.062]	1.22 [.048]	$1.22 \pm 0.08$ [.048 $\pm$ .003]

Figure 7

## C. Testing

Mating and unmating force must be measured using a testing device capable of holding the reading. It must also provide accurate alignment with slow and steady mating and unmating of the test tab and contact. Testing may be performed as described in National Electrical Manufacturers Association (NEMA) DC 2, "Residential Controls—Quick-Connect Terminals."

Test mating tabs must have dimensions as specified in Figure 6, except for the following:

1. Dimension C must have a tolerance of  $\pm 0.008$  mm [ $\pm .0003$  in.] for brass tabs and  $\pm 0.013$  mm [ $\pm .0005$  in.] for steel tabs.
2. Raised plateaus around detents must be limited to a total of 0.03 mm [.001 in.] for both sides.

The forces required to mate and unmate a test mating tab and contact shall be as specified in Figure 8.

MATING TAB SERIES	MATING AND UNMATING FORCES (N [lbs])					
	FIRST INSERTION (Max)	FIRST WITHDRAW (Max)	FIRST WITHDRAW (Min)		SIXTH WITHDRAW (Min)	
	Individual		Average	Individual	Average	Individual
250	76 [17]	76 [17]	22 [5]	13 [3]	18 [4]	13 [3]
250 (Unplated)	80 [18]	80 [18]	27 [6]	18 [4]	22 [5]	18 [4]
205	67 [15]	89 [20]	22 [5]	13 [3]	13 [3]	9 [2]
187	67 [15]	89 [20]	22 [5]	13 [3]	13 [3]	9 [2]
110	53 [12]	62 [14]	13 [3]	9 [2]	9 [2]	4 [1]

Figure 8

### 3.5. Repair

The contacts are not repairable once a termination has been made. Any defective or damaged contact must be replaced. These contacts must not be re-used by removing the wire.

### 4. QUALIFICATION

PIDG FASTON receptacle contacts are Component Recognized by Underwriters Laboratories Inc. (UL) in File E66717 and Certified by CSA International in File LR7189.

UL 310, "Standard for Electrical Quick-Connect Terminals" and CSA 22.2 #153, "Quick-Connect Terminals" provides product performance requirements and test information for all wire sizes except 26 through 24 AWG.

### 5. TOOLING

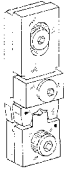
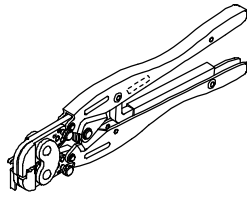
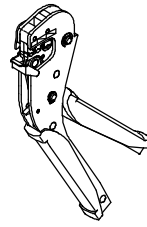
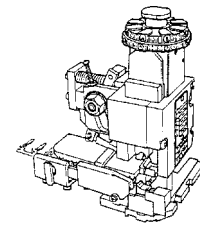
Tooling part numbers and instructional material packaged with the tooling are shown in Figure 9.

#### NOTE



*For assistance in setting up prototype and production line equipment, contact the TOOLING ASSISTANCE CENTER at the number at the bottom of page 1.*



Die Assembly (Typ,  
Refer to Table)Hand Crimping Tool (Typ,  
Refer to Table)TETRA-CRIMP Hand Crimping  
Tool 59824-1 (408-2823)Applicator (Typ,  
Refer to Table)

**NOTE:** Only TETRA-CRIMP tools should be used for UL and CSA applications.

DESCRIPTION	PART NUMBER	DOCUMENT NUMBER
Hand Tool	48518-2	408-1559
	90185-1	408-7278
	90246-1	408-7426
	90276-2	408-7903
Die Assembly	59826-1	408-2822
	59827-1	408-2822
	59828-1	408-2822
	69877-2	408-2423
	90240-2	408-7563
	90248-2	408-7563
Applicator	466554-3	408-8040
	466788-3	408-8063
	466788-4	408-8063
	466789-3	408-8063
	466789-4	408-8063
	466790-4	408-8063
	567200-2, -3	408-8082
	687658-1	408-8044
	687987-1	408-8040

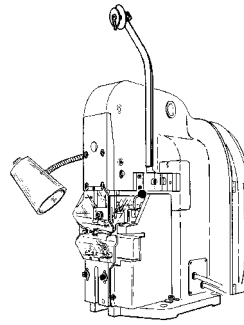
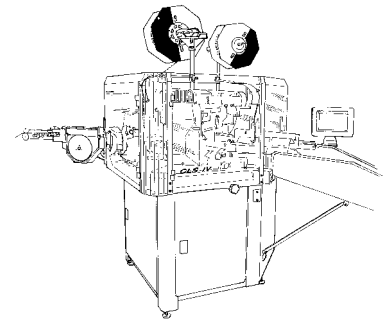
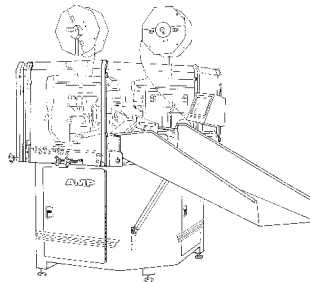
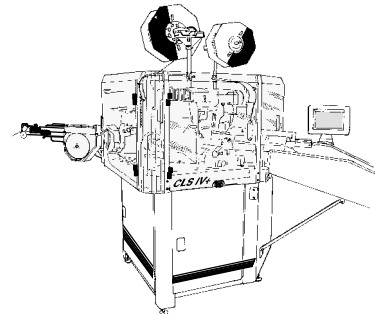
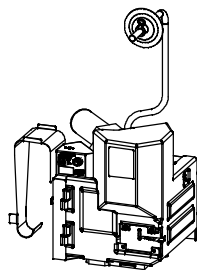
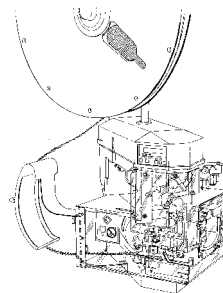
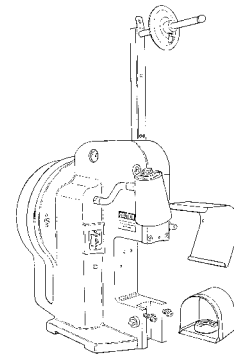
AMP-TAPETRONIC Machine  
69875 (409-1993)AMPOMATOR CLS IV  
Lead-Making Machine 217500-[]  
(409-5866)  
No Longer Manufactured NewAMPOMATOR CLS III-G  
Lead-Making Machine 122500-[]  
(409-5852)  
No Longer Manufactured NewAMPOMATOR CLS IV +  
Lead-Making Machine 356500-[]  
(409-5878)ELT Machine 1338600-[]  
(409-10016)AMP-O-LECTRIC Model "G"  
Terminating Machine 354500-[]  
(409-5842)AMP-O-LECTRIC Model "K"  
Terminating Machine 565435-5  
(409-5728)  
No Longer Manufactured New

Figure 9 (cont'd)

CONTACT SERIES	WIRE SIZE RANGE (AWG)	HAND TOOL	DIE ASSEMBLY (For Reeled Contacts Only)	APPLICATOR	POWER UNIT
110	26-24	48518-2	—	—	—
		—	69877-2	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
	22-18	59824-1	—	—	—
		90185-1⚡			
		—	59826-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
		—	—	466554-3	565435-5
				466788-3	122500-[ ] or 356500-[ ]
				687987-1 or 466788-4	565435-5
	16-14	—	59827-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875

⚡ For contacts with natural or black insulation only.

Figure 9 (cont'd)

CONTACT SERIES	WIRE SIZE RANGE (AWG)	HAND TOOL	DIE ASSEMBLY (For Reeled Contacts Only)	APPLICATOR	POWER UNIT
187	26-24	48518-2	—	—	—
		—	69877-2	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
	22-18	59824-1	—	—	—
		—	59826-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
			—	466788-3	122500-[ ] or 356500-[ ]
				466788-4	565435-5
	16-14	—	59827-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
			—	466789-3	122500-[ ] or 356500-[ ]
				466789-4	565435-5
205	22-18	59824-1	—	—	—
		—	59826-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
		90185-1■	—	466788-3	122500-[ ] or 356500-[ ]
				466788-4	565435-5
	16-14	59824-1	—	—	—
		—	59827-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875

■ For contacts with natural insulation only.

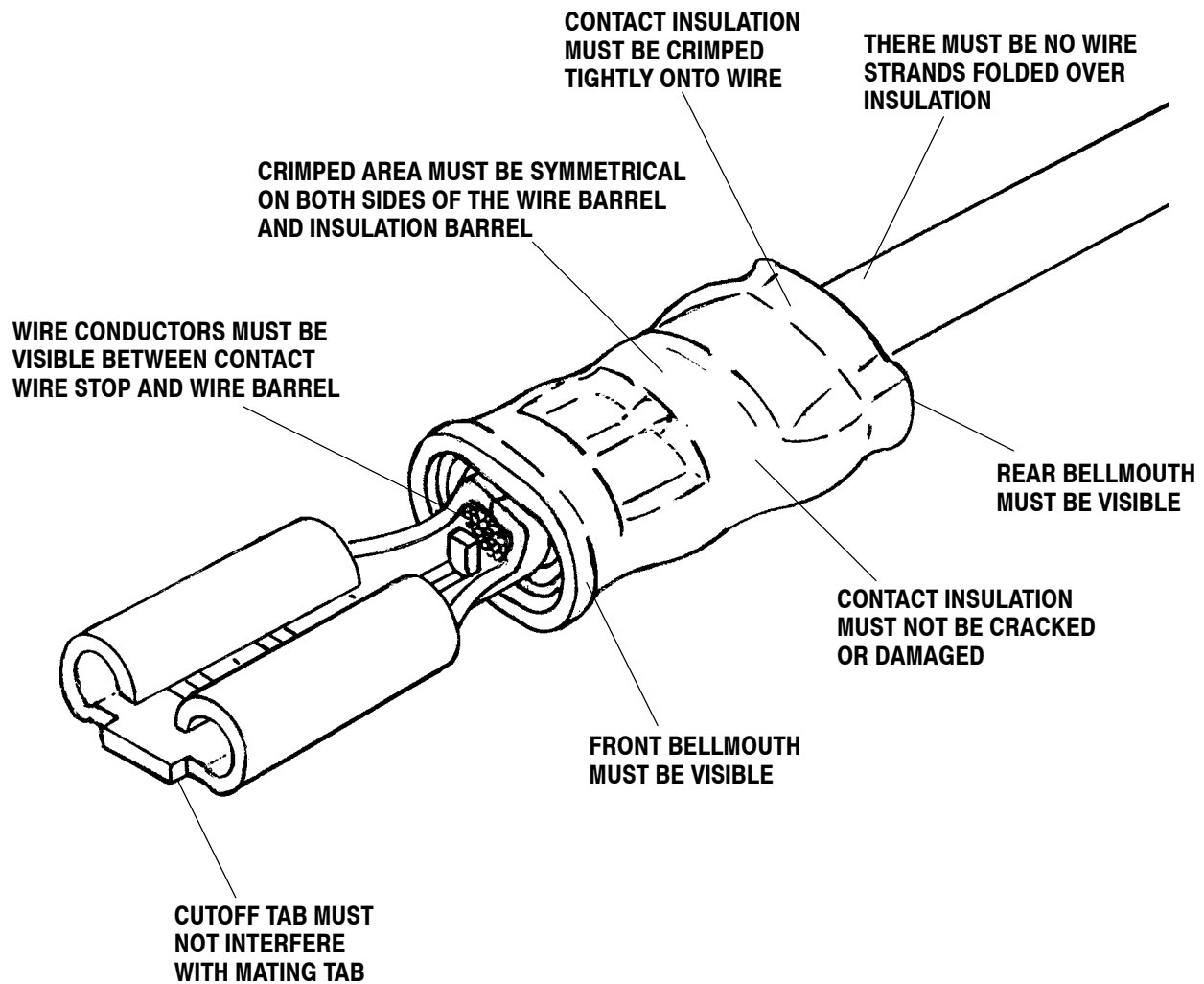
Figure 9 (cont'd)

CONTACT SERIES	WIRE SIZE RANGE (AWG)	HAND TOOL	DIE ASSEMBLY (For Reeled Contacts Only)	APPLICATOR	POWER UNIT
250	22-18	59824-1	—	—	—
		—	59826-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
			—	466788-3	122500-[ ] or 356500-[ ]
				466788-4	565435-5
		59824-1	—	—	—
	16-14	—	59827-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
			—	466789-3	122500-[ ] or 356500-[ ]
				466789-4	565435-5
	14-12	90246-1	—	—	—
		—	90240-2	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
	12-10	59824-1	—	—	—
		90276-2		—	—
		—	59828-1	567200-2	565435-5
				567200-3	354500-[ ] or 1338600-[ ]
				687658-1	122500-[ ] or 356500-[ ]
				—	69875
				466790-4	565435-5
		—	—	—	—

Figure 9 (end)

## 6. VISUAL AID

Figure 10 shows a typical application of PIDG FASTON receptacle contacts. 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**