



**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  $\pm 0.13$  [ $\pm 0.005$ ] 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 the next generation Grace Inertia 3.3 Connector system.

Basic terms and features of this product are provided in Figure 1.

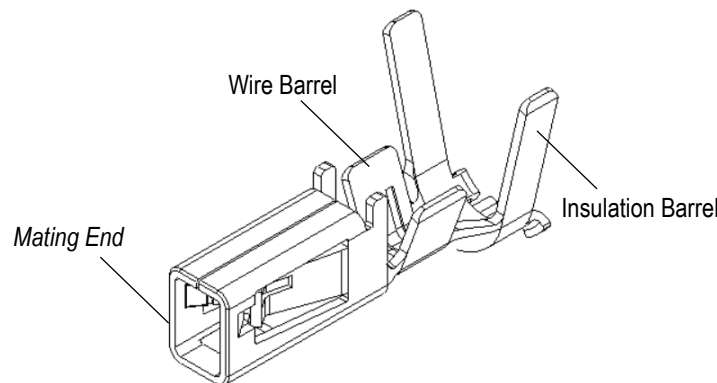


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

Revisions to this specification include:

- Updated template to corporate requirements
- Added PN 2318950-1

### 2.2. Customer Assistance

Reference Product Base Part Number 1983780 and Product Code K756 are representative of the Grace Inertia 3.3 Connector System. Use of these numbers will identify the product line and help you to obtain product and tooling information when visiting [www.te.com](http://www.te.com) or calling the 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 [108-106094](http://www.te.com) provides product performance and test results.

### 3. REQUIREMENTS

#### 3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

#### 3.2. Storage

##### A. Ultraviolet Light

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

##### B. Shelf Life

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

##### C. Chemical Exposure

Do not store product near any chemical listed below as they may cause stress corrosion cracking in the material.

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.

#### 3.3. Wire Selection and Preparation

The contacts accept 1 stranded copper wire sizes 20 AWG to 28 AWG [0.53 to 0.079 mm<sup>2</sup>] with an insulation diameter range of 0.8 to 2.5 [.031 to .098]. See Figure 3 for specific configurations.

Each wire must be stripped to the dimension given in Figure 3. A visual aid is given in Figure 2.



**CAUTION**

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

Note: Not to Scale

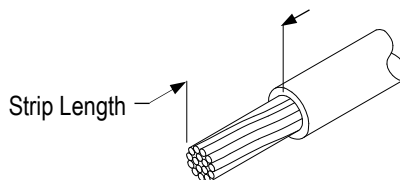


Figure 2

#### 3.4. Contact Crimp

##### A. Cutoff Tab

The cutoff tab is the remaining portion of the carrier strip after the contact is cut from the strip. The cutoff tab must not exceed the dimensions given in Figure 3.

##### B. Wire Barrel Crimp

The crimp applied to the wire barrel portion of the contact is the most compressed area and is most critical in ensuring optimum electrical and mechanical performance of the crimped contact. The crimp must be centered on the closed wire barrel. The crimp must result in an “F” crimp where the wire barrel forms a closed seam with no evidence of loose wire strands or wire strands visible in the seam. The crimp height and width must be within the dimensions given in Figure 3.

### **C. Insulation Barrel Crimp**

The crimp applied to the insulation barrel of the contact must result in either an “F” crimp where the insulation barrel forms a closed seam with no evidence of wire insulation in the seam. The crimp height and width must be within the dimensions provided in Figure 3.

### **D. Wire Barrel Flash**

Wire barrel flash is the formation that may appear on both sides of the wire barrel as the result of the crimping process. It must not exceed the dimension provided in Figure 3.

### **E. Twist and Roll**

There should be no twist or roll of the wire barrel or mating portion of the crimped contact that would cause overstress or impair usage. See Figure 3 for allowable limits.

### **F. Wire End Extrusion Length**

The wire conductor ends must extend beyond the end of the wire barrel within the dimensions given in Figure 3.

### **G. Bellmouths**

The front bellmouth and rear bellmouth shall conform to the dimensions given in Figure 3.

### **H. Wire Location**

All conductors must be held firmly inside the wire barrel. No strands can be folded back over the wire insulation. The wire insulation must be inside the insulation barrel, but must not enter the wire barrel. The wire conductors and insulation must be visible within the area between the wire barrel and insulation barrel as shown in Figure 3

### **I. Bend Allowance**

Then bend allowance between the wire barrel and the cable is acceptable within the limits given in Figure 3

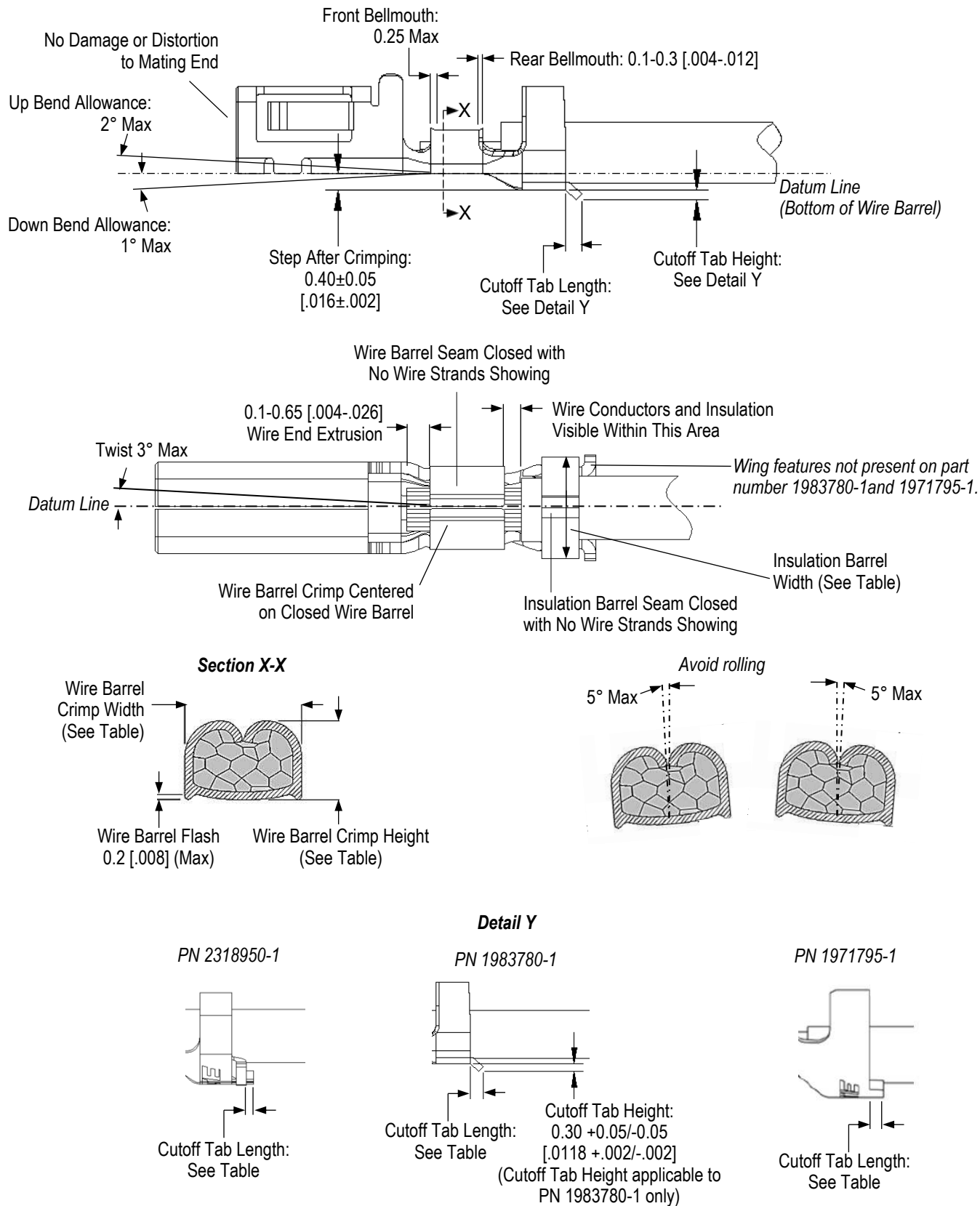


Figure 3 (continued)

Part Number	Applicator Number	Wire Size	Insulation Diameter Range†	Insulation Stripping Length	Wire Barrel Crimp		Insulation Barrel Crimp		Cut-off Tab Length	Crimp Tensile Strength /N (minimum)						
					Width	Height	Width	Height								
1971795-1	2151948-X	28 AWG [0.079 mm²]	1.08-1.5 [.0425-.059]	2.0±0.3 [.079±.012]	1.16 [.046] (Ref.)	With Applicator: 0.64±0.03 [.025±.001] ● With Hand Tool: 0.59-0.69 [.023-.027]	1.45 [.057] "F"	1.7 [.067] (Ref.)	0.25 [.001] (Max.)	9.8						
		26 AWG [0.12-0.15 mm²]				With Applicator: 0.71±0.03 [.028±.001] ● With Hand Tool: 0.59-0.69 [.023-.027]				19.6						
1983780-1	2151949-X	24 AWG [0.21-0.23 mm²]	1.5-2.0 [.059-.079]	2.0±0.5 [.079±.020]	1.27 [.050] (Ref.)	With Applicator: 0.74 [.029] With Hand Tool: 0.75 [.030]	2.6 [.102] "F"	2.4-2.7 [.094-.106] 2.6-2.8 [.102-.110] 2.75-2.85 [.108-.112]	0.40±0.10 [.016±.004]	29.4						
			2.0-2.4 [.079-.094]													
			2.4-2.5 [.094-.098]													
		22 AWG [0.31-0.38 mm²]	1.5-2.0 [.059-.079]								With Applicator: 0.80 [.031] With Hand Tool: 0.75 [.030]	2.4-2.7 [.094-.106]				
			2.0-2.4 [.079-.094]									2.6-2.8 [.102-.110]				
			2.4-2.5 [.094-.098]									2.75-2.85 [.108-.112]				
		20 AWG [0.51-0.53 mm²]	1.5-2.0 [.059-.079]			With Applicator: 0.93 [.037] With Hand Tool: 0.90 [.035]		2.4-2.7 [.094-.106]								
			2.0-2.4 [.079-.094]					2.6-2.8 [.102-.110]								
			2.4-2.5 [.094-.098]					2.75-2.85 [.108-.112]								
		2318950-1	2837471-X			24 AWG [0.21-0.23 mm²]		1.5-2.0 [.059-.079]		2.0±0.5 [.079±.020]	1.27 [.050] (Ref.)	With Applicator: 0.74 [.029]	2.6 [.102] "F"	2.4-2.7 [.094-.106] 2.6-2.8 [.102-.110] 2.75-2.85 [.108-.112]	0.25 [.001] (Max.)	29.4
								2.0-2.4 [.079-.094]								
								2.4-2.5 [.094-.098]								
22 AWG [0.31-0.38 mm²]	1.5-2.0 [.059-.079]			With Applicator: 0.80 [.031]	2.4-2.7 [.094-.106]											
	2.0-2.4 [.079-.094]				2.6-2.8 [.102-.110]											
	2.4-2.5 [.094-.098]				2.75-2.85 [.108-.112]											
20 AWG [0.51-0.53 mm²]	1.5-2.0 [.059-.079]			With Applicator: 0.93 [.037]	2.4-2.7 [.094-.106]											
	2.0-2.4 [.079-.094]				2.6-2.8 [.102-.110]											
	2.4-2.5 [.094-.098]				2.75-2.85 [.108-.112]											



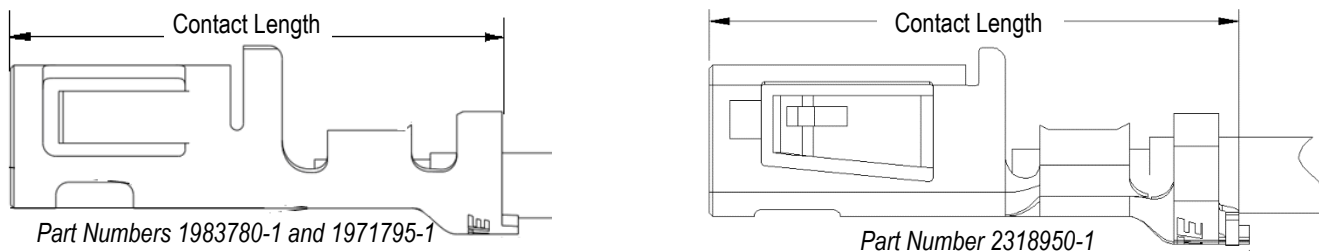
**NOTE**

- Hand Tool available for loose piece version of part number 1971795-1 only.
- † Hand Tool available for part number 1983780-1 only.
- ‡ Wire insulation diameter must be between 0.8-1.36 mm in order to use TPA part numbers 4-1971904-2 or 4-1971904-3.

**Figure 3 (end)**

### J. Contact Length

The contact length measured on the upper portion of the contact at the back of the contact stabilizer (not including the carrier strip cutoff tab) must be within the dimensions given in Figure 4.



Part Number	Contact Length (after Crimping)
1971795-1	7.55±0.2 [.297±.008]
1983780-1 2318950-1	8.4±0.25 [.331±.010]

Figure 4

### 3.5. Replacement and Repair

Damaged or defective product must not be used. The housings, contacts, TPA device, and seals are not repairable.

### 4. QUALIFICATION

Next Generation 3.3 Grace Inertia Connectors are recognized by Underwriters Laboratories Inc. (UL) in File E28476\_20121031.

### 5. TOOLING

Applicators contain the tooling for feeding and crimping strip-form terminals. Automatic machines provide the power to operate the applicator. See Figure 5 for representative images.

Tooling information for product part numbers is available from [www.te.com](http://www.te.com) or by calling the Product Information Center at the number at the bottom of page 1.

#### 5.1. Machine (Power Unit)

The machine provides the force required to drive an applicator for crimping the contacts. These machines can be set up to automatically measure, cut, strip and terminate wire.

#### 5.2. Applicator

Applicators for product part numbers are available in Figure 3 and from the [Applicator Search Portal](#) on [www.te.com](http://www.te.com) or by calling the Product Information Center at the bottom of page 1.

#### 5.3. Hand Tools

Hand tools for product part numbers are available from the [Hand Tool Search Portal](#) on [www.te.com](http://www.te.com) or by calling the Product Information Center at the bottom of page 1.



Figure 5

## 6. VISUAL AID

Figure 6 shows a typical application of this product. 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.

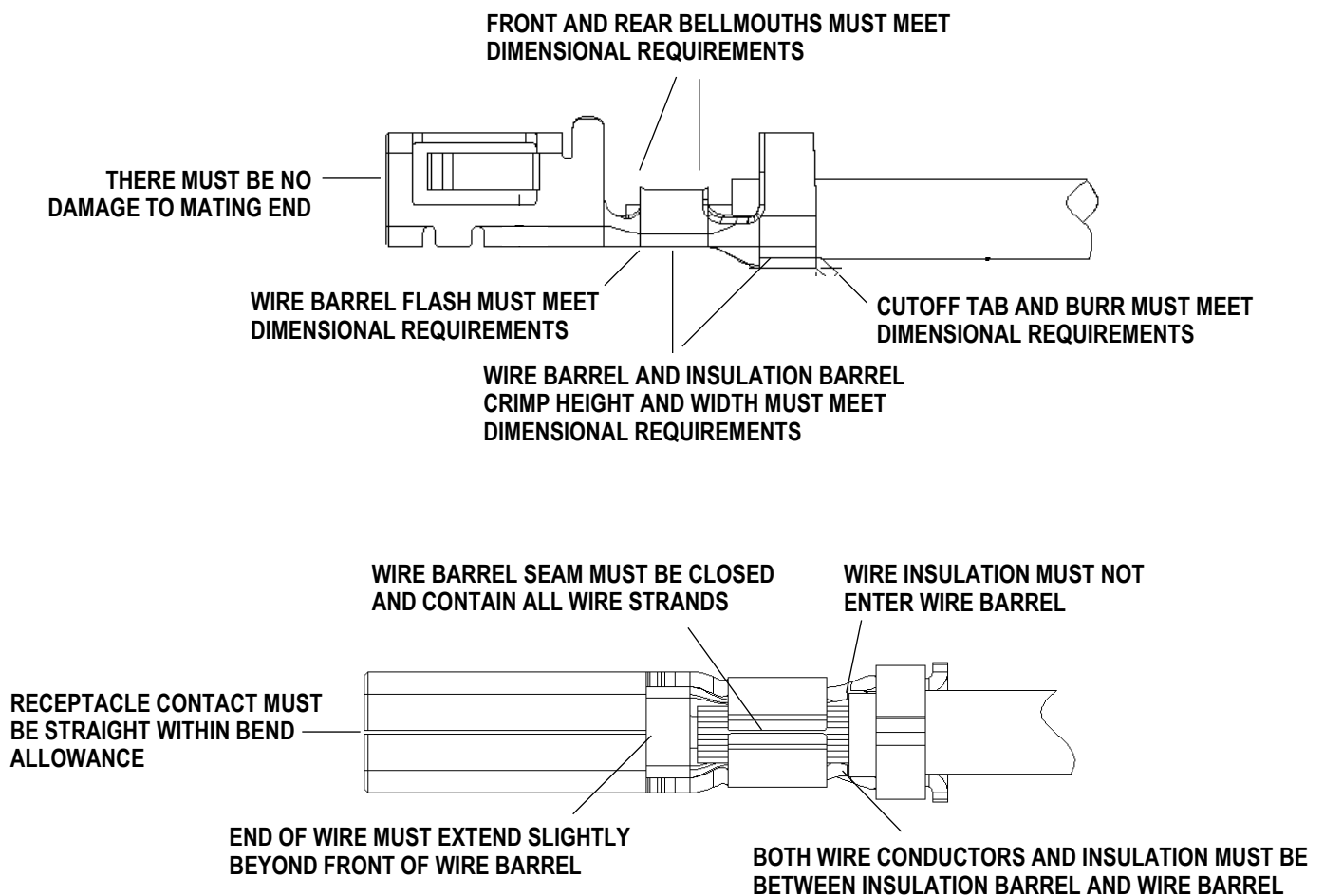


Figure 6