

## Power Ring Connectors

**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 Power Ring Connectors. The connectors are designed to be mounted to the chassis of a household appliance.

Each connector consists of a housing, two copper tone terminals, one silver tone terminal, a ground strap (optional), three screws, and three nuts. The housing features mounting holes and three terminal slots. The terminals feature a locking lance, a wire barrel, an insulation support barrel, and a tab for a screw and nut. There are wire barrel designs to cover a wide range of 18 through 10 AWG stranded copper wire. (Refer to the specific customer drawing for the appropriate wire size range.) The tab end will accept stranded copper household wire that is within a range of 6 through 10 AWG. This wire can be used unterminated, or it can be terminated with any precision formed or custom-made terminal with a maximum thickness of 3.175 mm [.125 in.]. See Figure 1 for optional Ring Tongue Terminal.

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.

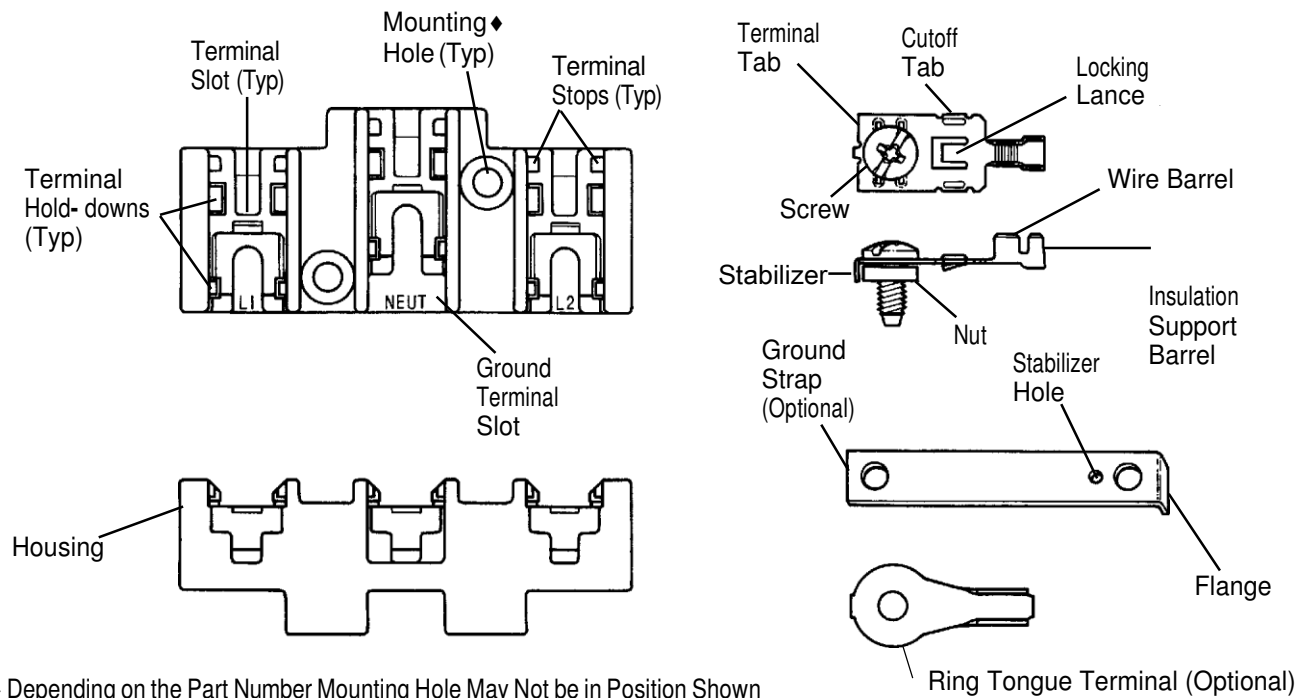


Figure 1

## 2. REFERENCE MATERIALS

### 2.1. Revision Summary

- Updated document to corporate requirements and new layout and format
- Added new text to Figure 1, and Paragraphs 3.5.3 a, b, and c
- Moved dimensions from text in Paragraphs 3.2.C thru 3.2.F to Figure 3
- Added new Figures and renumbered

### 2.2. Customer Assistance

Reference Base Product Part Number 520942 and Product Code 1073 are representative of Power Ring 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 Product Information Center at the 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. Instructional Material

The following list includes available instruction sheets (408- series) that provide assembly procedures for product, operation, maintenance and repair of tooling, as well as setup and operation procedures of applicators; and customer manuals (409- series) that provide setup, operation, and maintenance procedures of machines.

<u>Document Number</u>	<u>Document Title</u>
408- 3295	Preparing Reel of Contacts for Applicator Tooling
408- 7424	Checking Terminal Crimp Height or Gaging Die Closure
408- 8040	Heavy Duty Miniature Quick- Change Applicator (Side- Feed Type)
408- 8053	Conversion Guide for Miniature Quick-Change Applicators
408- 8059	General Preventive Maintenance for
Applicators	
408- 9816	Handling of Reeled Products
409- 5842	AMP- O- ELECTRIC* Model "G" Terminating Machine 354500-[]

### 2.5. Specifications

Product Specification 108- 1191 provides product performance and test information. Application Specification 114- 2084 provides application requirements for Ring Tongue Terminals that can be used in these connectors.

## 3. REQUIREMENTS

### 3.1. Storage

#### A. Ultraviolet Light

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

#### B. Shelf Life

The components should be used on a first in, first out basis to avoid storage contamination that could adversely affect electrical continuity.

#### C. Chemical Exposure

Do not store contacts near any chemicals listed below.

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

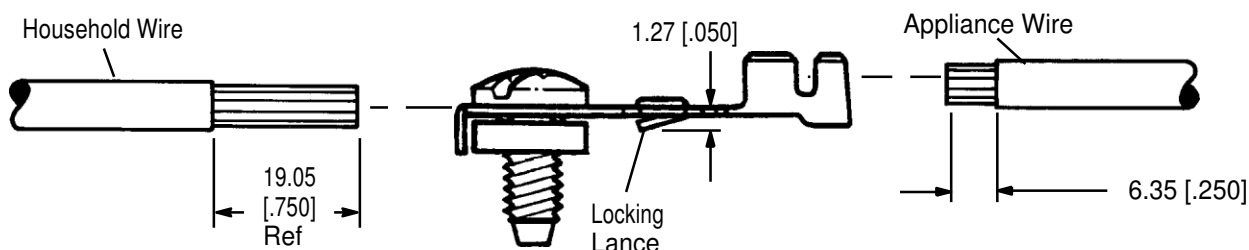
## 3.2. Wire Selection and Preparation

### A. Wire Selection

The crimping barrels are designed to accept 18 through 10 AWG stranded copper wire, and the tab end of the terminal is designed to receive 6 through 10 AWG stranded copper household wire. Refer to Figure 2 for wire combinations, wire strip lengths, and crimp height values of terminals crimped in the specified heavy-duty applicator.

### B. Wire Preparation

The appliance wires and the household wires must be stripped to the dimension shown in Figure 2. Care must be exercised to prevent cutting or nicking of the conductors.



WIRE SIZE (AWG)	INSULATION DIAMETER (MAX)	WIRE BARREL CRIMP	
		HEIGHT $\pm 0.05$ [.002]	WIDTH (NOMINAL)
18	4.06 [.160]	2.36 [.093]	3.56 [.140]
16	4.06 [.160]	2.46 [.097]	3.56 [.140]
16	7.87 [.310]	2.51 [.099]	4.57 [.180]
14	4.06 [.160]	2.64 [.104]	3.56 [.140]
14	7.87 [.310]	2.64 [.104]	4.57 [.180]
12	4.06 [.160]	2.90 [.114]	3.56 [.140]
12	7.87 [.310]	2.87 [.113]	4.57 [.180]
10	7.87 [.310]	3.23 [.127]	4.57 [.180]
14 (2 Wires)	4.06 [.160] Each•	3.07 [.121]	3.56 [.140]
14 (2 Wires)	4.32 [.170] Each	3.02 [.119]	4.57 [.180]
12 (2 Wires)	4.32 [.170] Each	3.45 [.136]	4.57 [.180]

- Strip one wire to 6.35 mm [.250 in.] and the second wire long enough that the insulation will not enter the insulation support barrel.

Figure 2

## 3.3. Crimp Requirements

### A. Locking Lance

The end of the locking lance should be the dimension shown below the terminal tab plane as indicated in Figure 3. Inspection of several un-crimped contacts will provide the required visual appearance before and after crimping of a terminal.

### B. Carrier Cutoff Tab and Burr Allowance

Neither cutoff tab shall extend beyond the side of the terminal and the maximum allowable burr on the cutoff is provided in Figure 3.

### C. Crimp Configuration and Location

The crimp applied to the wire portion of the terminal is the most compressed area, and is the most critical to assure optimum performance of the termination. The effective length shall be as defined in

Figure 3 (excluding bell mouths) over the length of the wire barrel.

The wire barrel will be crimped in the “F” Crimp configuration where the tips of the wire barrel will turn inward and encapsulate all wire strands. The insulation support barrel may be crimped in the “F” or “O” Crimp configuration where the tips of the insulation barrel will encapsulate the insulation and form the insulation support. See Figure 3.

#### D. Wire Barrel Seam

The wire barrel shall be completely closed with no portion of the conductor protruding from the seam. The crimp flash along the sides of the wire barrel that are caused by the crimping pressure and allowable tolerances in the tool shall not exceed the dimension provided in Figure 3.

#### E. Conductor Location

The conductor of the wire may be flush to a protrusion of what is shown in Figure 3 from the front of the wire barrel. Both insulation and conductor should be visible in the transition area between the insulation and wire barrels. No insulation should be in the wire barrel.

#### F. Bell mouths

The bell mouths that are caused by extrusion of the terminal metal during termination shall be as shown for the rear and the front bell mouths. See Figure 3.

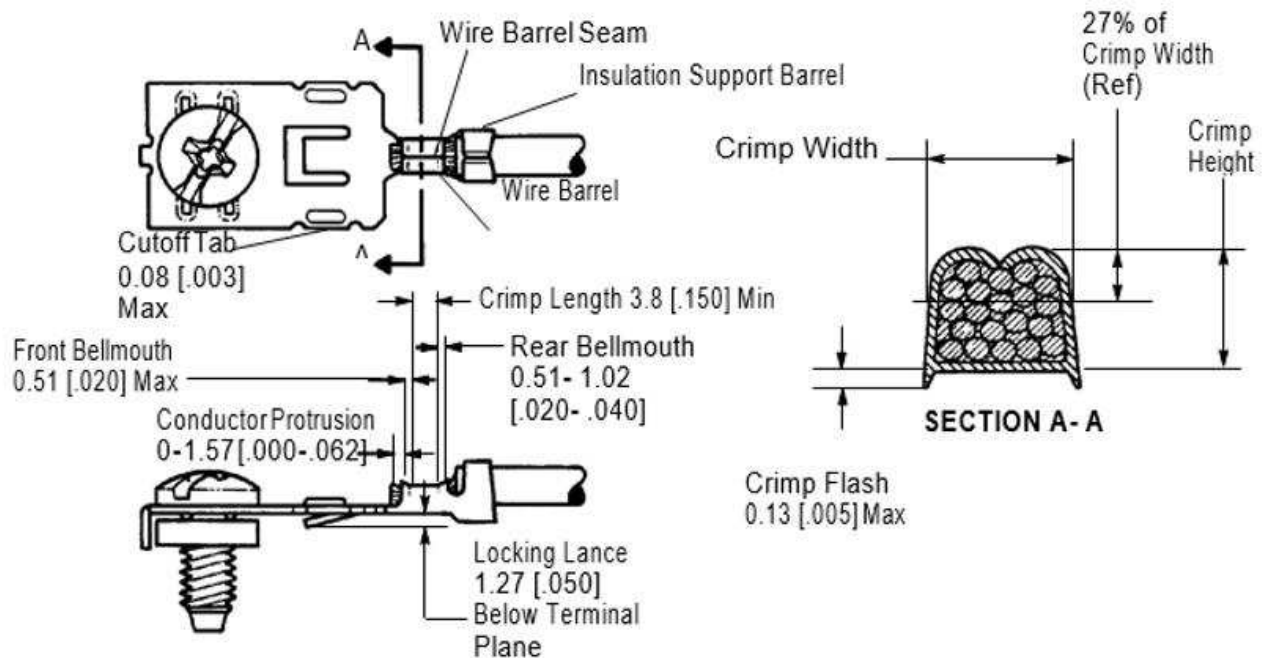


Figure3

#### G. Insulation

The insulation should not be visibly damaged, broken, or cut after crimping.

#### H. Vertical and Horizontal Straightness

Terminals must be straight and aligned within the tolerance shown in Figure 4.

#### I. Twist or Roll

The twist or roll of the crimped terminal must not exceed the limits specified in Figure 4.

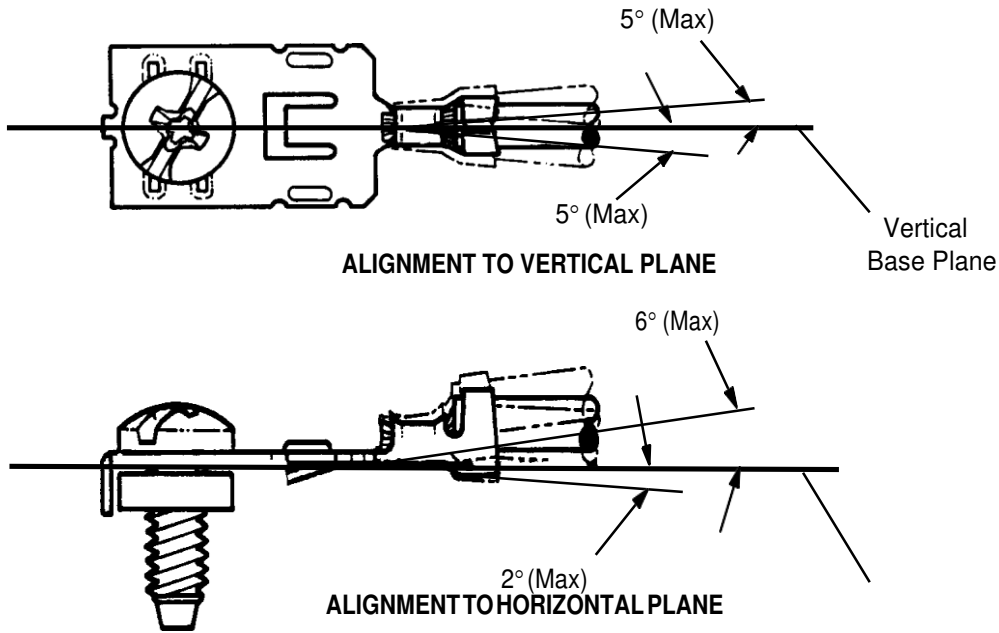


Figure 4 (cont'd)

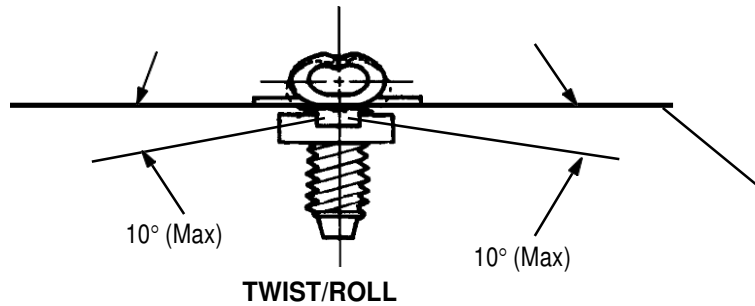


Figure 4 (End)

### 3.4. Housing

#### A. Hole Layout

The mounting plane hole layout for the two offset mounting holes and the single ground strap is provided in Figure 5.

#### NOTE



When selecting a location for the connector, the wire bend radius specified by the wire manufacturer must be considered. Also, to permit attachment of the wire, there should be sufficient slack between the wire end and any strain relief.

#### B. Attaching Hardware

Any commercially available hardware such as Sheetmetal screws, bolts and nut, rivet or other hardware that is compatible with the mounting plane may be used to secure the housing to the mounting plane.

**NOTE:** Typical hole layout. For specific hole layouts for your production requirements contact Tyco Electronics at the numbers at the bottom of page 1.

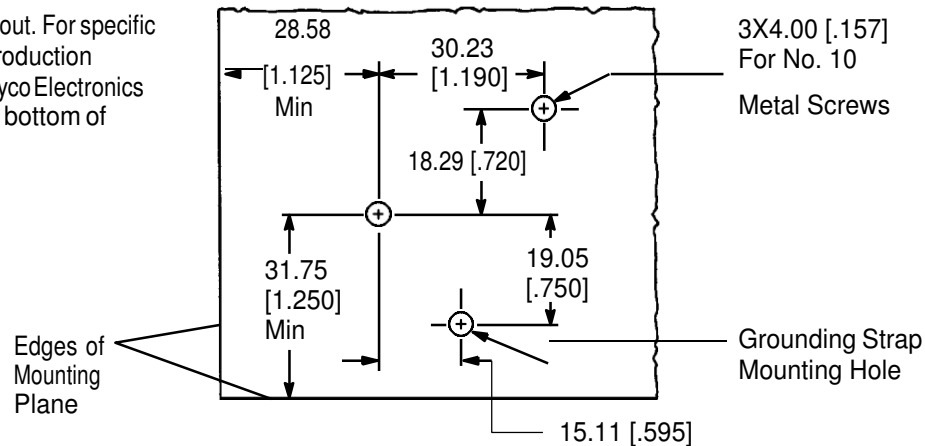


Figure 5

### 3.5. Attaching Appliance and Household Wire (Figures 6, 7, 8 and 9)

The household wire can be attached to the terminal tab as bare wire or with a terminal attached. Any precision formed or custom-made terminal of 3.18 mm [.125 in.] maximum thickness may be used. See Figure 6 for the Ring Tongue Terminal which may be used. Grounding the appliance through the ground wire (center/neutral position) with the ground strap is optional. Figures 6 and 7 provides a composite of the various termination techniques. The assembly procedures for all techniques are covered by the following text.

1. Crimp the appliance wire to the tab terminal wire and insulation barrels using the tooling and crimping instructions packaged with the tooling.
2. Lay the appliance wire on the center of the terminal cavity then, guiding the terminal under the terminal hold-downs, pull back on the wire until the terminal locking lance passes over the housing locking rib and locks behind the rib. Please refer to Figure 6 and 7.

**NOTE**



*A terminal can be extracted from the housing by depressing the locking lance slightly with a small flat-bladed screwdriver a sliding the terminal forward and out of the housing. Re-setting of the locking lance is necessary. See Figure 2 for dimension.*

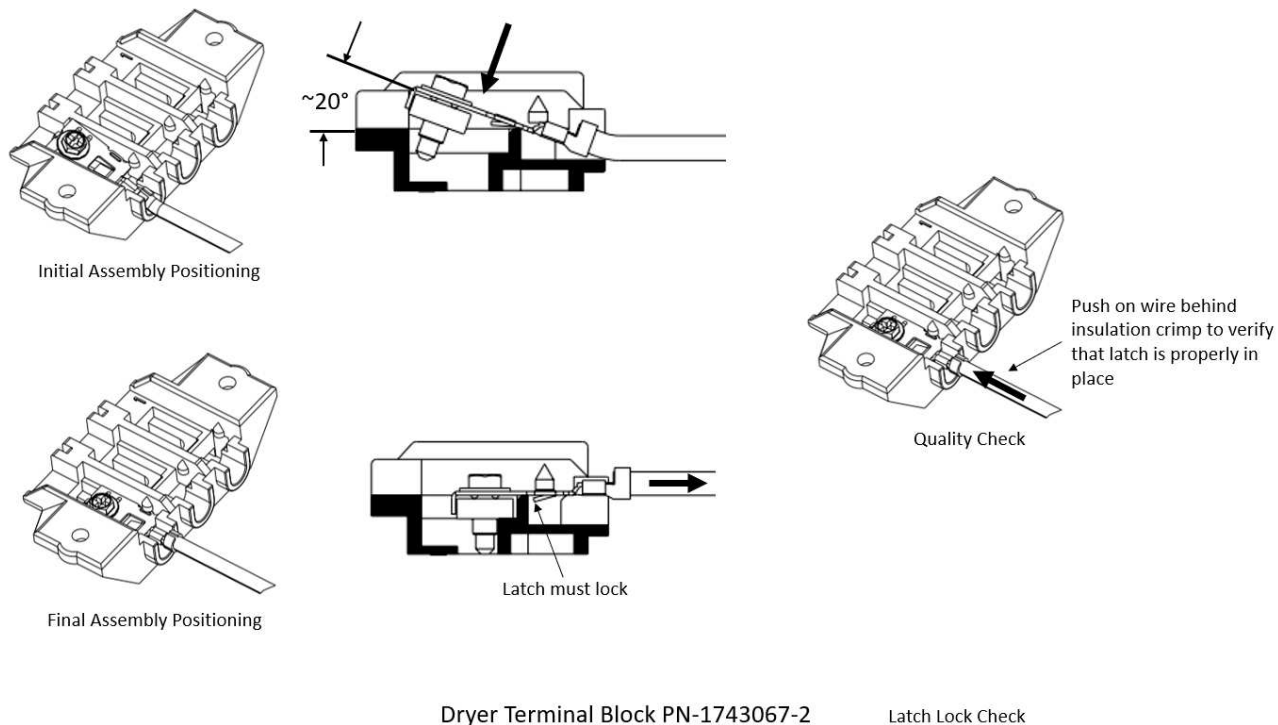


Figure 6

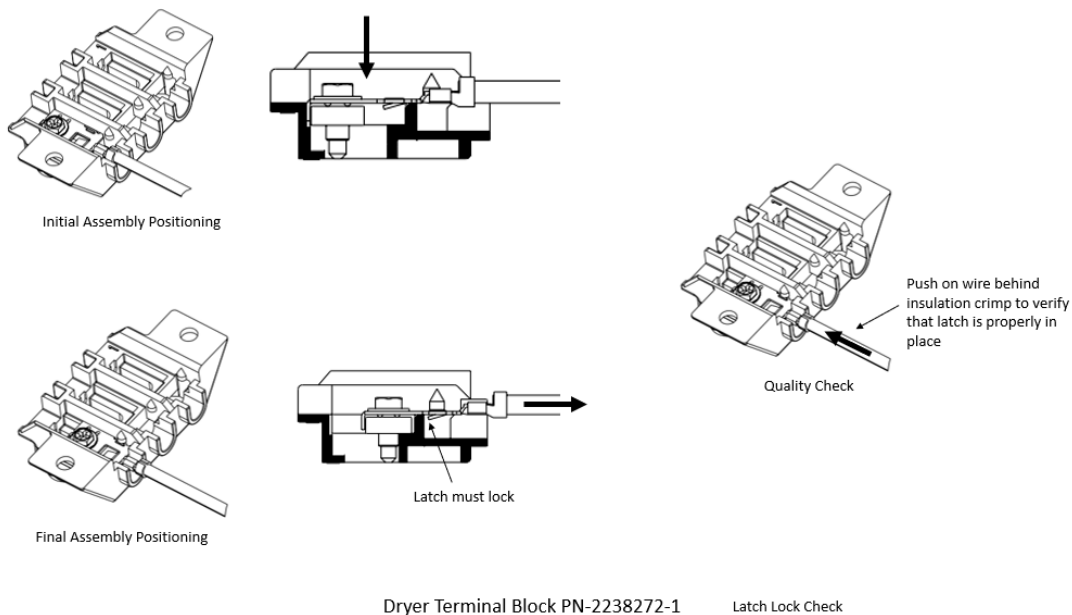


Figure 7

**NOTE**



The latch design will plastically deform during insertion and only has to work once.



## 3. Position and secure the household wire.

**NOTE**


Each terminal tab screw is to be tightened to the torque value specified in the table in Figure 8.

HOUSEHOLD WIRE SIZE (AWG)	TORQUE FORCE MINIMUM (N [IN. LBS])
6	200 [45]
8	178 [40]
10	156 [35]

Figure 8

a. Bare wire must be placed between the nut and terminal tab. It may be splayed and separated in the center or used unsplayed as a mass of circular stranded wire. Either way they must be placed between the nut and terminal tab and secured by the screw.

b. Crimped wire terminal must be located between the screw head and terminal tab. Remove the screw and place the crimped contact on the terminal tab with the crimp seam up, then re- insert the screw. To minimize the potential for cross- threading, initially rotate the screw counter- clockwise and then rotate clockwise until secure as indicated in the table above.

c. Ground strap (optional) must be placed between nut and terminal tab with stabilizer through stabilizing hole. Remove screw and place end of strap with stabilizing hole under terminal tab and re- insert screw. If using bare ground wire, place it on top of ground strap and secure screw. If using terminated wire, place terminal between screw head and tab, and secure screw. Follow the procedure described in “b” above to minimize cross- threading.

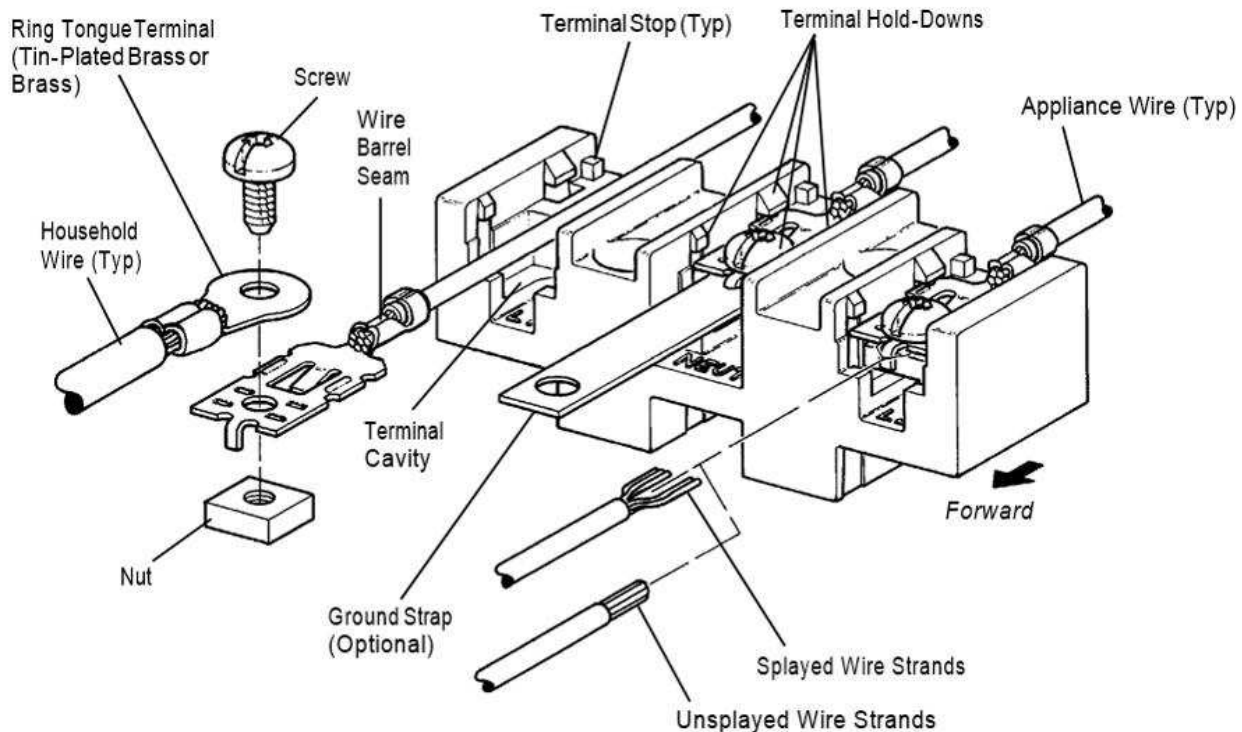


Figure 9



#### 4. QUALIFICATIONS

Power Ring Connectors are Component Recognized by Underwriters Laboratories Inc. (UL) in File E60677.

#### 5. TOOLING

Tooling part numbers and instructional material packaged with the tooling are shown in Figure 10.

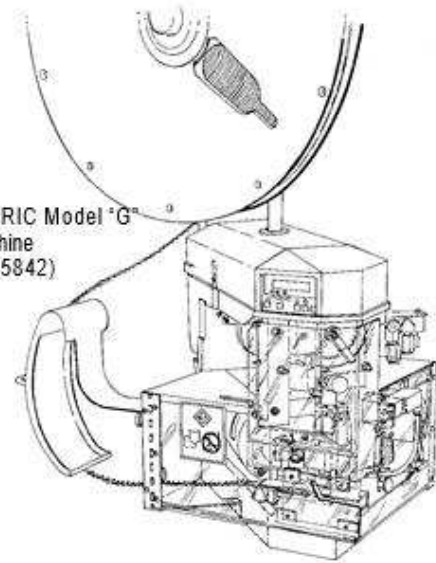
**NOTE**

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



Typical Heavy Duty  
Miniature Quick-  
Change Applicator  
(408- 8040)

AMP- O- LECTRIC Model "G"  
Terminating Machine  
354500-1 (409-5842)

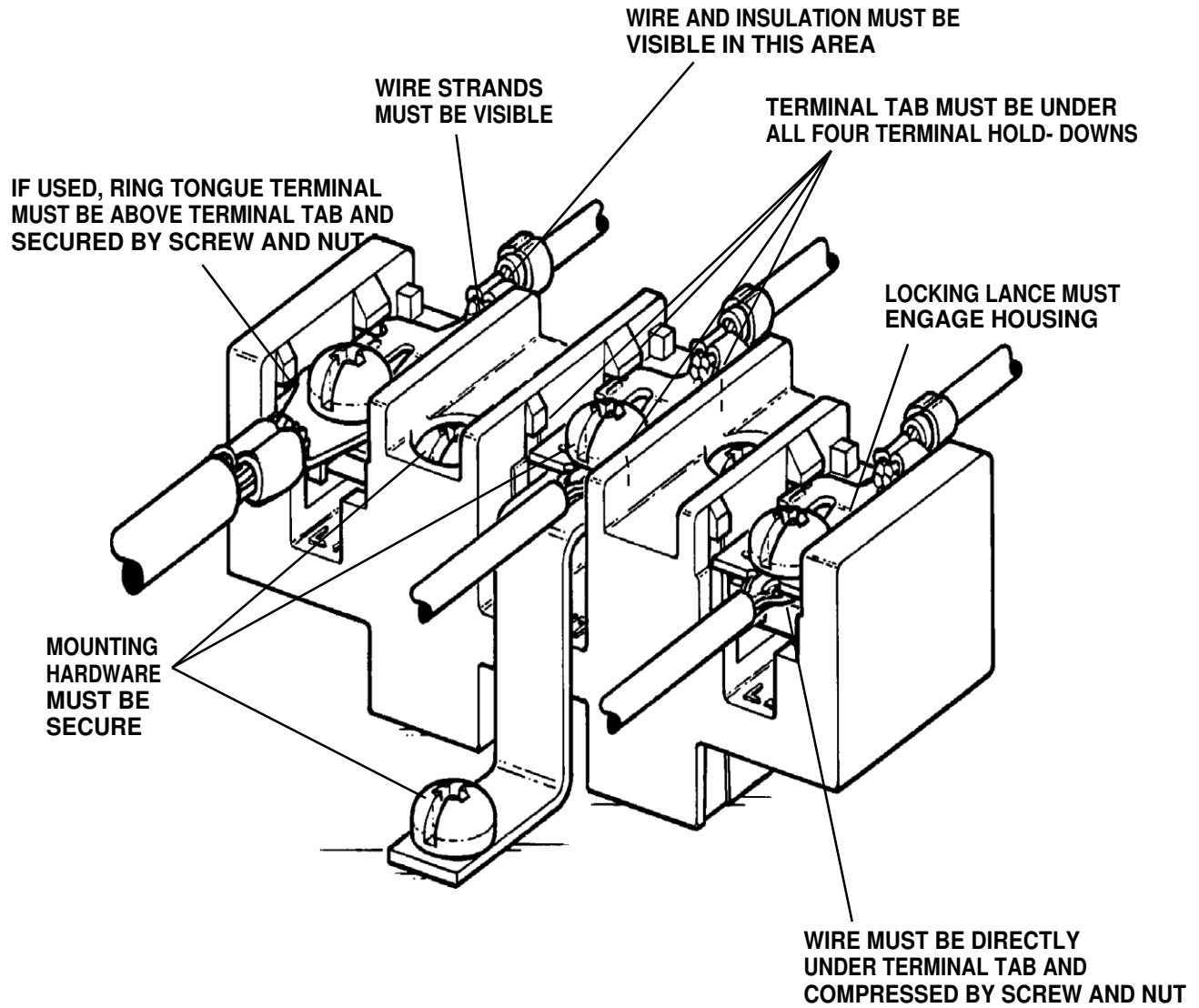


WIRE SIZE (AWG)	INSULATION DIAMETER (MAX)	APPLICATOR (DOCUMENT)	POWER UNIT (DOCUMENT)
18	4.06 [.160]	567253- 2 (408- 8040)	354500- 1 (409- 5842)
16	4.06 [.160]	567253- 2 (408- 8040)	
16	7.87 [.310]	567294- 2 (408- 8040)	
14	4.06 [.160]	567253- 2 (408- 8040)	
14	7.87 [.310]	567294- 2 (408- 8040)	
12	4.06 [.160]	567253- 2 (408- 8040)	
12	7.87 [.310]	567294- 2 (408- 8040)	
10	7.87 [.310]	567289- 2	-----
14 (2 Wires)	4.06 [.160]	567253- 2 (408- 8040)	354500- 1 (409- 5842)
14 (2 Wires)	4.32 [.170]	567294- 2 (408- 8040)	
12 (2 Wires)	4.32 [.170]	567294- 2 (408- 8040)	

Figure 10

## 6. VISUAL AID

Figure 11 shows a typical application of Power Ring Connectors. 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 11. VISUAL AID**