



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 mm [$\pm .005$ in.] 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 Cluster Block Housings and Contacts designed for high shock resistant applications. There are housings and contacts to mate with 2.29 and 3.18 [.090 and .125] diameter pin contacts of customer supplied receptacle assemblies.

Housings are available as one-piece assemblies for pin contacts 2.29 and 3.18 [.090 and .125]. There are stranded wire contacts available for 22 through 10 AWG (lead wire) and there are solid conductor magnet wire (AMPLIVAR*) contacts with a serrated wire barrel available for 400 through 8500 CMA. The contacts are designated as Series 090 or 125 to correspond with the mating pin diameter for which the contacts have been designed. The contacts are available in strip form for automatic machine application only. When the contacts are installed in a housing, the assembled components become a connector.

When corresponding with TE Connectivity 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.

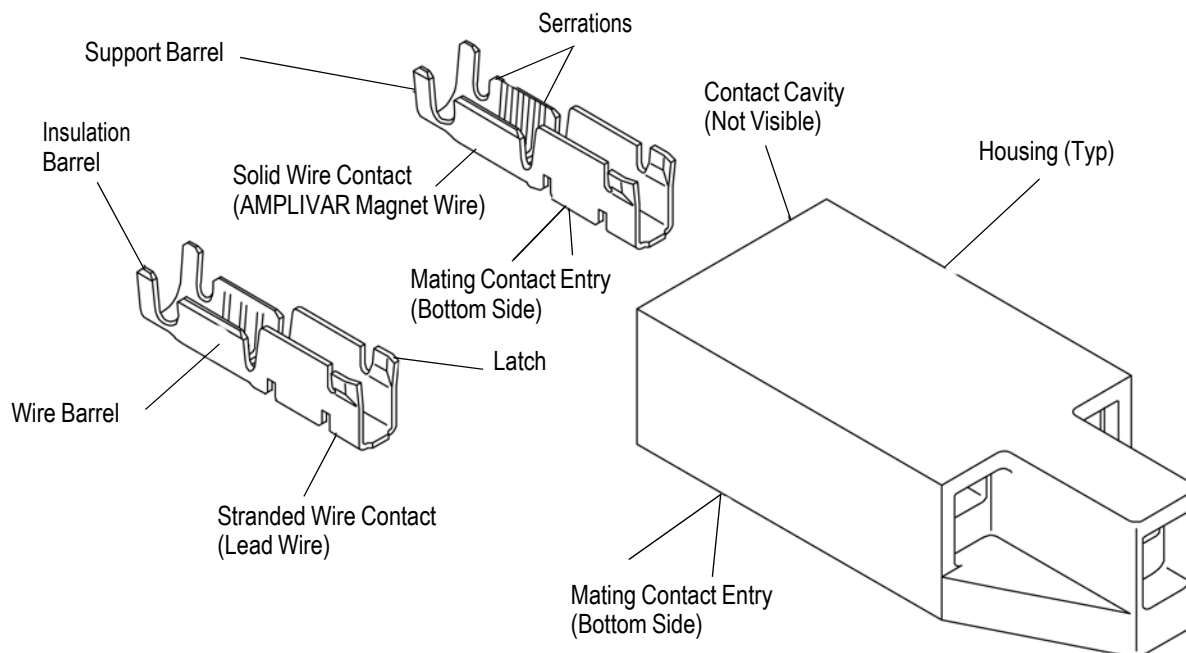


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

- Added new text to titles in tables of Figure 4
- Added new columns in tables of Figure 4

2.2. Customer Assistance

Reference Base Part Number 62244 and Product Code 1397 are representative numbers of Cluster Block Housings and 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 TE Representative or, after purchase, by calling the Tooling Assistance Center or Product Information numbers at the bottom of page 1.

2.3. Drawings

Customer drawings for product part numbers 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 the company.

2.4. Product Specifications

Product Specification 108-2008 for Cluster Block Assembly provides test and performance results.

2.5. Instructional Specifications

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 of machines.

- 408-3295 Preparing Reel Of Contacts for Application Tooling
- 408-7424 Checking Terminal Crimp Height or Gaging Die Closure
- 408-7497 Recommended Procedures for the "Crush" Crimp Technique
- 408-8039 Heavy Duty Miniature Quick-Change Applicators (End-Feed Type)
- 408-9439 Extraction Tool 274186-1
- 408-9816 Handling of Reeled Products
- 409-5128 Basic AMP-O-LECTRIC* Model "K" Terminating Machine 565435-5
- 409-5841 AMPLIVAR Product Terminators
- 409-5842 AMP-O-LECTRIC Model "G" Terminating Machines 354500- [] and 1213127-[]
- 408-5876 AMPLIVAR Direct Connect Product Terminator

3. REQUIREMENTS

3.1. Storage

The housings and contacts should remain in the shipping containers until ready for use. They should be used on a first in, first out basis to avoid storage contaminants.

3.2. Wire

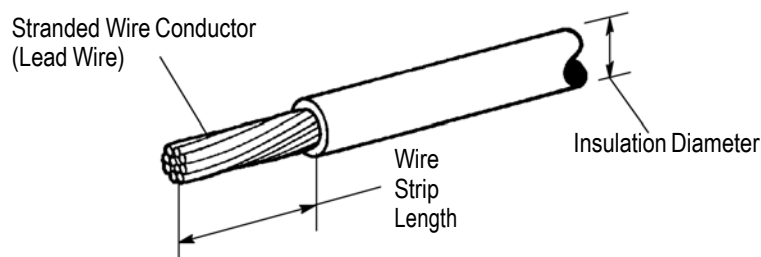
A. Size

There are stranded wire contact designs to cover 22 through 10 AWG wire size range and an insulation diameter range of [.070 to .160], and there are solid conductor contact designs to cover 400 through 8500 CMA wire range. The complete wire size range for which contacts are available is provided in Figures 2, 3, and 4.

B. Preparation

When stripping the stranded wire, use care to avoid scraping, nicking, or cutting the conductor. The end of the solid conductor wire must be straight to facilitate placement in the contact for crimping. A protective sleeve can be used on the solid conductors.

For stranded wire strip length, see tables in Figure 2 and Figure 3. For wire exposure length of solid conductor wires, see illustration for solid wire conductors in Figure 4.



Note: Not to scale.

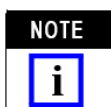
WIRE			CONTACT (EXCEPT 1742657)			CRIMPED TENSILE STRENGTH NEWTONS [lbs]
WIRE SIZE mm² (AWG)	INSULATION SIZE(RANGE)	WIRE STRIP LENGTH	WIRE BARREL CRIMP HEIGHT	CRIMP WIDTH		
				WIRE BARREL	INSULATION BARREL	
0.8 [18]	4.06-1.78 [.160-.070]	4.75 [.187]	1.47 [.058]	2.29 [.090]	3.94 [.155]	110 [25]
	2.62-1.50 [.103-.059]		1.50 [.059]	2.79 [.110]	3.56 [.140]	
	2.62 [.130] Max	6.22 [.245]	1.96 [.073]		3.94 [.155]	
1.3 [16]	4.06-1.78 [.160-.070]	4.75 [.187]	1.65 [.065]	2.29 [.090]	3.56 [.140]	165 [37]
	2.62-1.50 [.103-.059]			2.79 [.110]		
	2.62 [.130] Max	6.22 [.245]	2.01 [.079]		3.94 [.155]	
	4.32 [.170] Max		2.06 [.081]	3.56 [.140]	4.57 [.180]	
2.0 [14]	4.32 [.170] Max	2.24 [.088]	254 [57]			
3.3 [12]	4.32 [.170] Max	2.54 [.100]				310 [70]
5.2 [10]	4.32 [.170] Max	2.97 [.117]				

Figure 2

WIRE			CONTACT (1742657)			CRIMPED TENSILE STRENGTH MINIMUM NEWTONS [lbs]
WIRE SIZE mm² [AWG]	INSULATION SIZE (Max)	WIRE STRIP LENGTH ±0.38 [.015]	WIRE BARREL CRIMP HEIGHT ±0.05 [.002]	CRIMP WIDTH (F-TYPE)		
				WIRE BAR-REL	SUPPORT BARREL	
0.33 [22]	2.79 [.110]	6.22 [.245]	1.35 [.053]	2.29 [.090]	3.56 [.140]	44.5 [10]
0.5 [20]	2.79 [.110]		1.42 [.056]			58 [13]
(2) X 0.33 [(2) X 22]	(2) x 2.29 [.090]		1.47 [.058]			44.5 [10]
0.8 [18]	2.79 [.110]		1.52 [.060]			110 [25]
0.35[22]	2.40[.094]		1.23[0.048]			44 [10] (**)
0.75[18]			1.36[.054]			85 [19] (**)
0.50[20]	2.00[.079]	5.00[.20]	1.27[.050]	2.79 [.110] (*)	58 [13] (***)	
0.75[18]			1.36[.054]		85 [19] (***)	

Figure 3

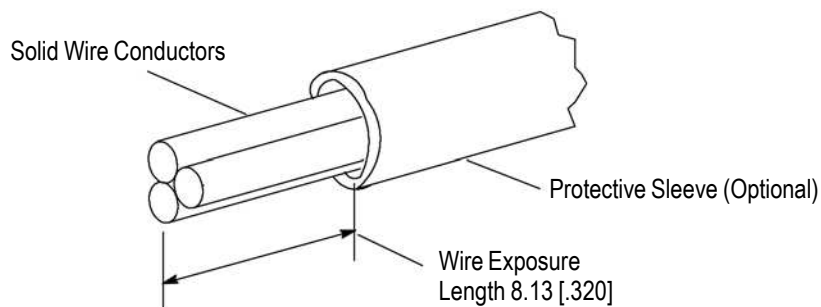
Remarks: (*) Crimp Width (O-Type).
(**) For contact PN 1599105-1. Applicator PN 2150441-2
(***) For contact PN 1599107-1. Applicator PN 2150577-2



The crimp dimensions represent the functional range for wire/product combination and may be applied with any one of a variety of tools that have been designed for unique production requirements. Applied crimp height may vary among tool types as long as it is within range specified for the product. To obtain crimp dimensions for a specific tool, refer to the instruction sheet packaged with manual crimping tools and the applicator log packaged with power crimping tools.

3.3. Crimped Contact

Stranded wire contacts have been designed for insulated stranded American Wire Gauge (AWG), and solid wire contacts are designed for magnet wire with a specific Circular Mil Area (CMA) range to be used with or without an insulating sleeve. Also, a combination of solid magnet wires or stranded wires can be used in single contact as long as the CMA for the contact is not exceeded.



CMA OF WIRE	CONTACT CRIMP HEIGHT FOR COPPER MAGNET WIRE						
	090 SERIES			125 SERIES			
	CMA RANGE 400 THRU 1600	CMA RANGE 1500 THRU 3000	CMA RANGE 1600 THRU 4800	CMA RANGE 400 THRU 1600	CMA RANGE 1500 THRU 4200	CMA RANGE 3000 THRU 5000	CMA RANGE 4000 THRU 8500
400	1.07 [.042]	--	--	1.17 [.046]	--	--	--
500	--	--	--	1.19 [.047]	--	--	--
600	1.09 [.043]	--	--	1.19 [.047]	--	--	--
700	--	--	--	1.22 [.048]	--	--	--
800	1.14 [.045]	--	--	1.25 [.049]	--	--	--
900	--	--	--	1.25 [.049]	--	--	--
1000	1.17 [.046]	--	--	1.27 [.050]	--	--	--
1100	--	--	--	1.27 [.050]	--	--	--
1200	1.19 [.047]	--	--	1.30 [.051]	--	--	--
1300	--	--	--	1.32 [.052]	--	--	--
1400	1.22 [.048]	--	--	1.32 [.052]	--	--	--
1500	--	1.52 [.060]	--	1.35 [.053]	1.50 [.059]	--	--
1600	1.27 [.050]	--	1.47 [.058]	1.37 [.054]	--	--	--
1700	--	1.55 [.061]	--	--	1.52 [.060]	--	--
1800	--	--	1.50 [.059]	--	--	--	--
1900	--	1.60 [.063]	--	--	1.55 [.061]	--	--
2000	--	--	1.52 [.060]	--	--	--	--
2100	--	1.63 [.064]	--	--	1.58 [.062]	--	--
2200	--	--	1.55 [.061]	--	--	--	--
2300	--	1.65 [.065]	--	--	1.60 [.063]	--	--
2400	--	--	1.58 [.062]	--	--	--	--
2500	--	1.70 [.067]	--	--	1.63 [.064]	--	--
2600	--	--	1.60 [.063]	--	--	--	--
2700	--	1.73 [.068]	--	--	1.65 [.065]	--	--
2800	--	--	1.63 [.064]	--	--	--	--
2900	--	1.75 [.069]	--	--	1.68 [.066]	--	--
3000	--	1.78 [.070]	1.65 [.065]	--	--	1.88 [.074]	--
3100	--	--	--	--	1.70 [.067]	--	--
3200	--	--	1.68 [.066]	--	--	1.90 [.075]	--

Figure 4 (Cont'd)

CMA OF WIRE	CONTACT CRIMP HEIGHT FOR COPPER MAGNET WIRE						
	090 SERIES			125 SERIES			
	CMA RANGE 400 THRU 1600	CMA RANGE 1500 THRU 3000	CMA RANGE 1600 THRU 4800	CMA RANGE 400 THRU 1600	CMA RANGE 1500 THRU 4200	CMA RANGE 3000 THRU 5000	CMA RANGE 4000 THRU 8500
3300	--	--	--	--	1.68 [.068]	--	--
3400	--	--	1.70 [.067]	--	--	1.93 [.076]	--
3500	--	--	--	--	1.75 [.069]	--	--
3600	--	--	1.73 [.068]	--	--	1.96 [.077]	--
3700	--	--	--	--	1.78 [.070]	--	--
3800	--	--	1.75 [.069]	--	--	1.98 [.078]	--
3900	--	--	--	--	1.80 [.071]	--	--
4000	--	--	1.78 [.070]	--	--	2.01 [.079]	1.93 [.076]
4100	--	--	--	--	1.83 [.072]	--	--
4200	--	--	1.80 [.071]	--	1.85 [.073]	2.03 [.080]	1.96 [.077]
4400	--	--	1.83 [.072]	--	--	2.05 [.081]	1.98 [.078]
4600	--	--	1.85 [.073]	--	--	2.08 [.082]	2.01 [.079]
4800	--	--	1.88 [.074]	--	--	2.10 [.083]	2.03 [.080]
5000	--	--	--	--	--	2.16 [.085]	2.03 [.080]
5200	--	--	--	--	--	--	2.05 [.081]
5400	--	--	--	--	--	--	2.08 [.082]
5600	--	--	--	--	--	--	2.10 [.083]
5800	--	--	--	--	--	--	2.13 [.084]
6000	--	--	--	--	--	--	2.13 [.084]
6200	--	--	--	--	--	--	2.16 [.085]
6400	--	--	--	--	--	--	2.18 [.086]
6600	--	--	--	--	--	--	2.21 [.087]
6800	--	--	--	--	--	--	2.24 [.088]
7000	--	--	--	--	--	--	2.24 [.088]
7200	--	--	--	--	--	--	2.26 [.089]
7400	--	--	--	--	--	--	2.28 [.090]
7600	--	--	--	--	--	--	2.31 [.091]
7800	--	--	--	--	--	--	2.31 [.091]
8000	--	--	--	--	--	--	2.34 [.092]
8200	--	--	--	--	--	--	2.36 [.093]
8400	--	--	--	--	--	--	2.39 [.094]
8500	--	--	--	--	--	--	2.41 [.095]

Figure 4 (End)

A. Crimp Height and Width

The crimp applied to the wire portion of the contact is the most compressed area and is the most critical in assuring optimum performance. The applied crimp dimension must be within the range specified for each contact wire size range. See Figure 2, Figure 3, and Figure 4.

NOTE



AMPLIVAR solid wire contact crimp tooling may shear transition area at front edge of wire barrel to achieve proper crimp height requirements.

NOTE



The following illustrations show insulated stranded lead wire except where essential to differentiate between the two contact types. The dimensional and wire placement criteria apply to stranded lead wire and solid magnet wire except as noted.

B. Carrier Cutoff Tab

Cutoff tabs must be visible at both ends of the contact, but they must not extend beyond the limits specified in Figure 5.

C. Burr Allowance

Burrs resulting from the shearing of the cutoffs must not exceed the burr allowance shown in Figure 5.

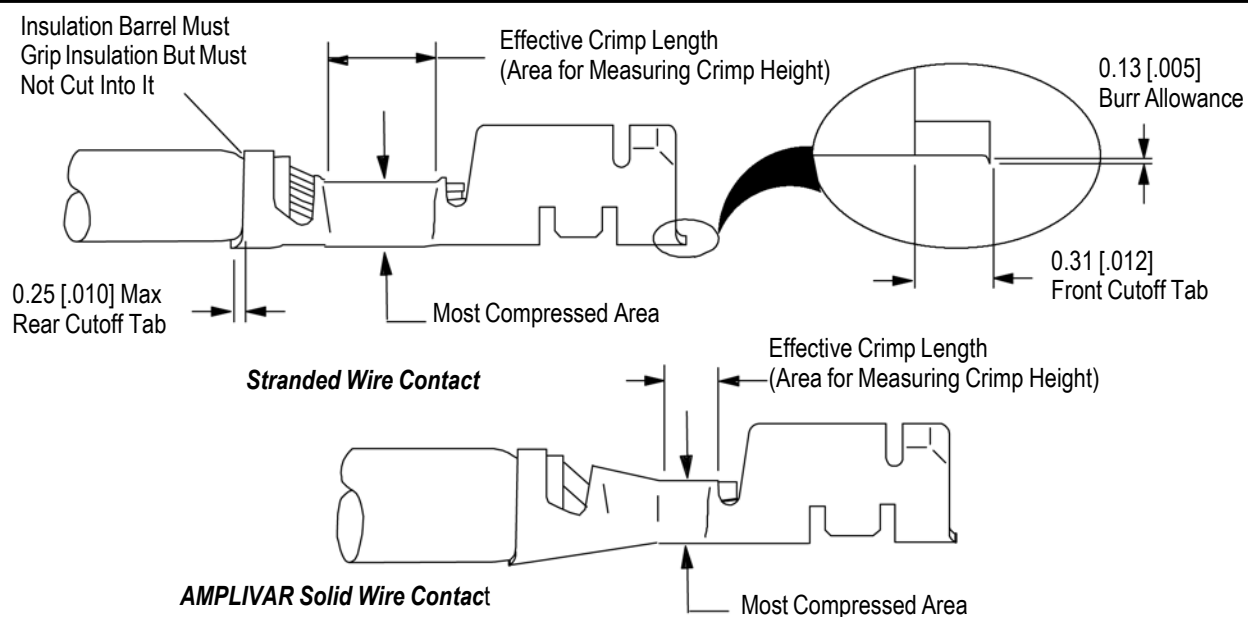


Figure 5

D. Crimped Configuration

The wire barrel will be crimped so that the tips of the wire barrel will turn inward and capture all wire strands. The insulation barrel will be crimped so that the tips of the insulation barrel will butt against each other and grip the insulation firmly without cutting into it to form an insulation support. See Figure 6.

E. Bellmouth

The front and rear bellmouths caused by extrusion of the contact metal during the crimping process of the stranded wire contacts shall be within the limits provided in Figure 7. AMPLIVAR solid wire contacts may not exhibit front and rear bellmouths due to crimp tooling design requirements.

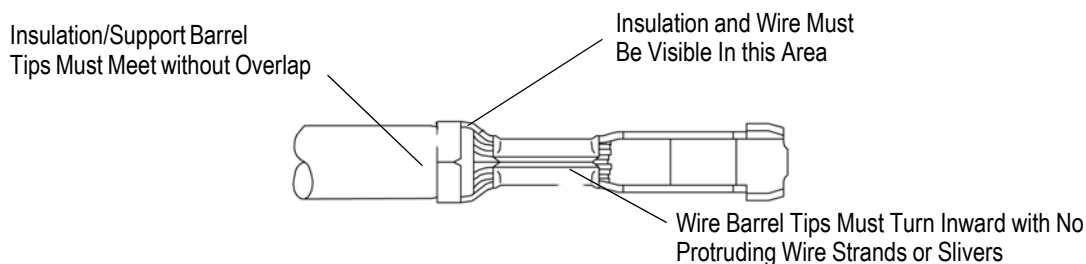


Figure 6.

F. Effective Crimp Length

The effective crimp length over the length of the wire barrel shall be within the area between the bellmouths as indicated in Figure 7.

G. Wire Barrel Flash

Flash that may appear on either side of the crimped contact shall not exceed the maximum limit specified in Figure 7.

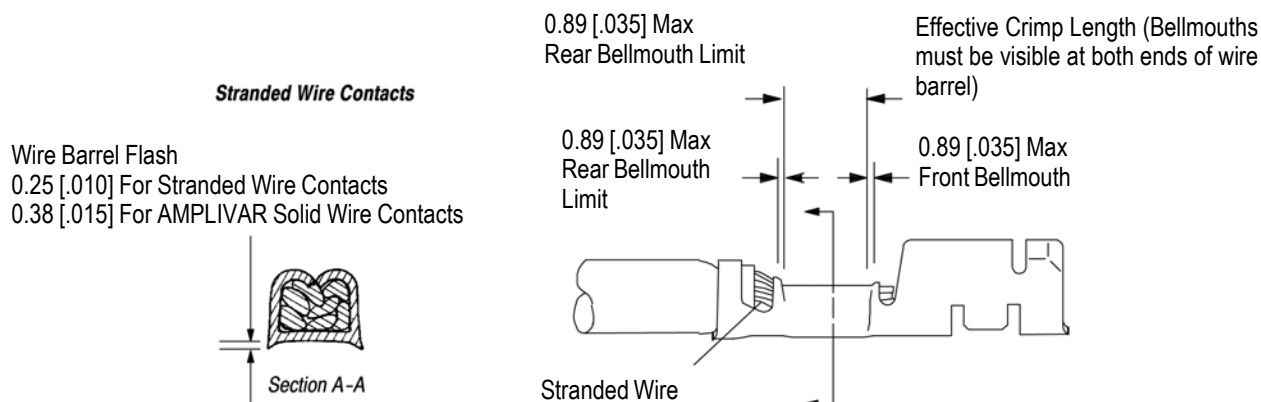


Figure 7

H. Wire Barrel Seam

The wire barrel seam shall be completely closed with no portion of the conductors protruding from the seam. See Figure 8.

I. Conductor Location

The conductor of the wire must be flush or within the protrusion limit specified from the front of the wire barrel. Both insulation and conductor should be visible in the transition area between the insulation barrel and wire barrel. No insulation should be in the wire barrel. See Figure 8.

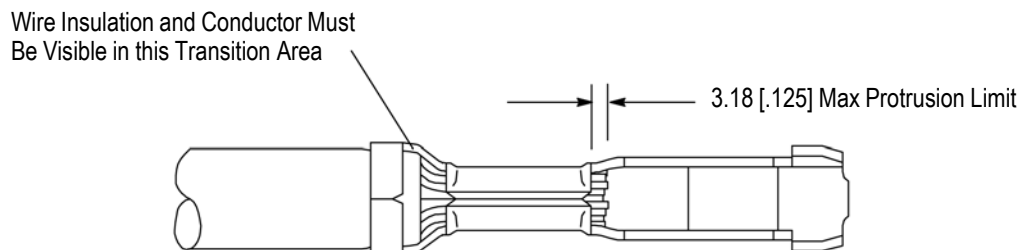


Figure 8

J. Vertical and Horizontal Straightness

Crimped contacts must be straight and aligned within the tolerance shown in Figure 9.

K. Twist or Roll

The twist or roll of the crimped portion of the contact in relation to the uncrimped portion of the contact may not exceed the limits shown in Figure 9.

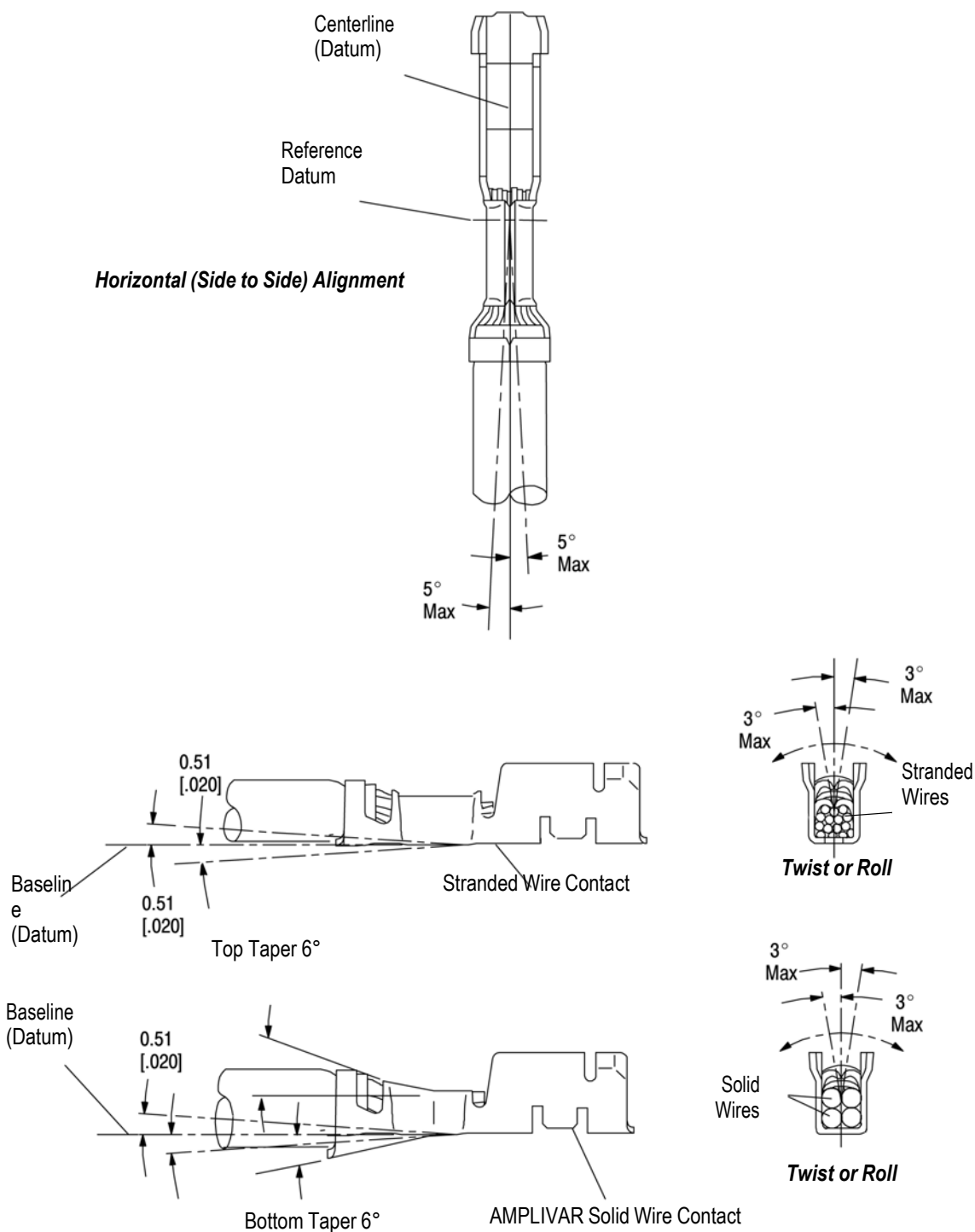


Figure 9

3.4. Placement of Crimped Contact in Housing

The contact must be inserted with the open portion oriented toward the rib inside the housing. When fully inserted, the contact latches will engage a recess inside the housing that provides a seat for the contact. See Figure 10.

3.5. Repair/Replacement



Damaged product should not be used. If a damaged contact is evident, it should be cut from the wire and replaced with a new one. Contacts must not be re-terminated. Damaged housings should not be used.

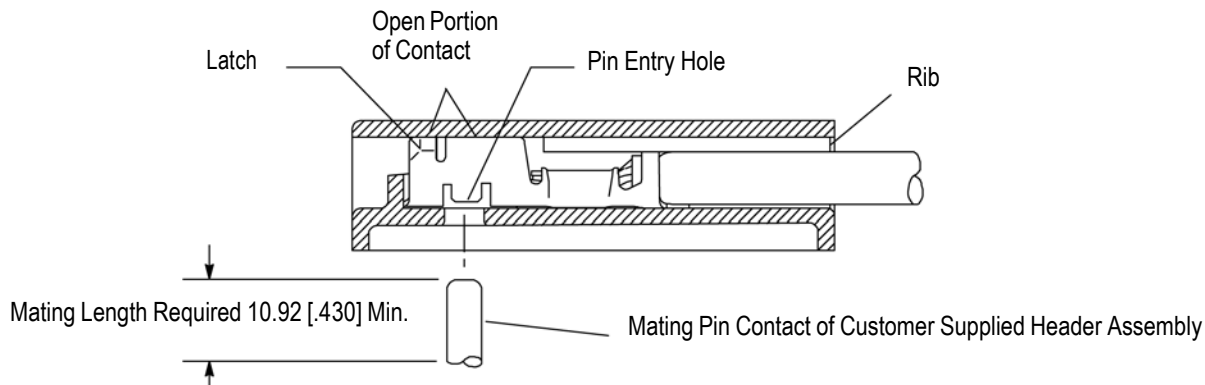


Figure 10

4. QUALIFICATIONS

Cluster Block Housings and Contacts are Recognized by the Component Program of Underwriters Laboratories (UL) Inc. in File Number E28476.

5. TOOLING

This section provides a selection of extraction tools and crimping tools for various application requirements. The crimping tools include miniature quick-change applicators that can be used with various power units, and self-contained, semi-automatic machines with die assemblies for a specific application. Modified designs and additional crimping tool concepts may be available to meet other application 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 11.

5.1. Extraction Tools

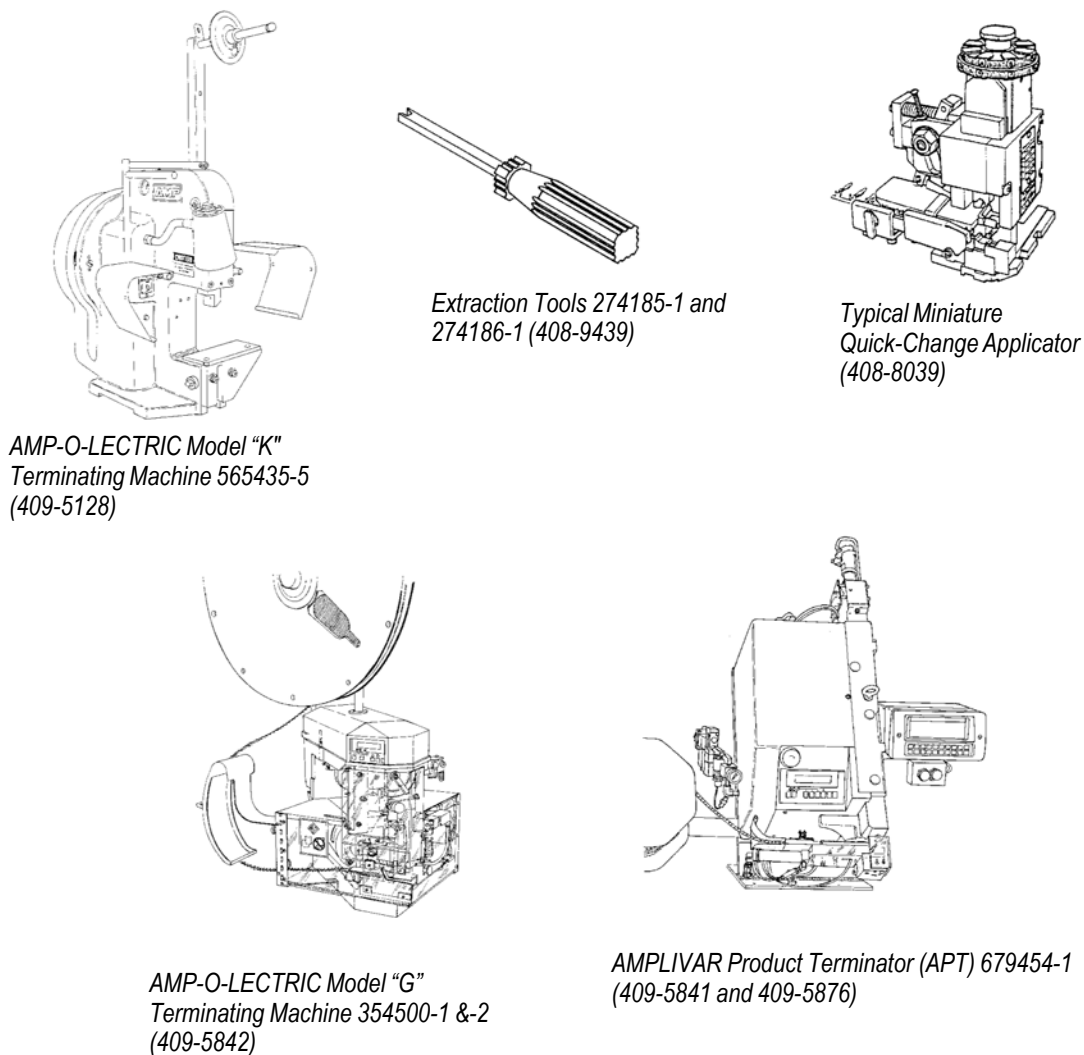
There are two extraction tools designed for removing contacts from the housing. The tool used will depend on the contact series to be removed. See Figure 11.

5.2. Applicators

Heavy-Duty Quick-Change Miniature Applicators have been designed for high-volume production. There are several designs available to accommodate the various power units that can be used. The applicators are adjustable for the full wire size range of the contacts. See Figure 11.

5.3. Power Units

There are several power units recommended for crimping reel-fed AMPLIVAR Cluster Block Contacts. Three of them are bench-mount machines; the AMP-O-LECTRIC Model "K" and Model "G" Terminating Machine Power Units, and the AMPLIVAR Product Terminator (APT) assemblies. See Figure 11.



CONTACT WIRE SIZE RANGE	AMP-O-LECTRIC MODEL "K" MACHINE	AMP-O-LECTIC MODEL "G" MACHINE	AMLIVAR PRODUCT TERMINATOR (APT)
22-18	--	1852639-1	--
18-16	--	--	--
18-14	466158-5	--	--
14-10	1-466277-1	--	--
400-1600	567248-1	567248-3	--
1500-4200	--	567249-1 or -3	679454-1
4000-8500	--	567250-3	679454-1

Figure 11

6. VISUAL AID

Figure 12 shows a typical application of this product line. 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.

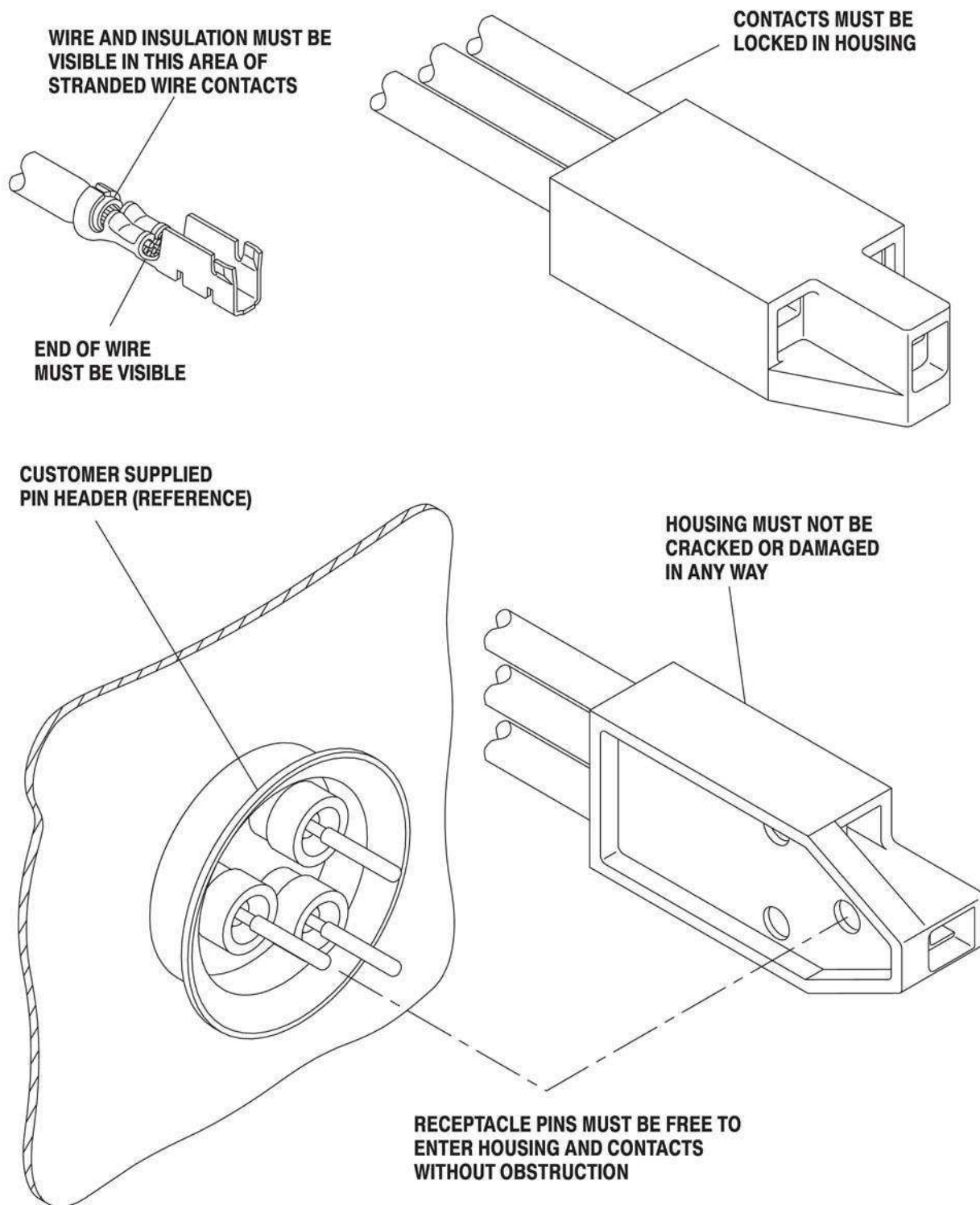


FIGURE 12. VISUAL AID