Automotive On-Board Diagnostic Connector

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 [±.005] and angles have a tolerance of ±2°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of the Automotive On-Board Diagnostic Connector. The receptacle connector mounts onto a metal or plastic automotive instrument panel and mates with a plug on a portable diagnostic tester, per SAE Recommended Practice J-1962. The housing features panel polarization bosses, panel latches, and anti-rattle wings. The housing will accept a maximum of 16 contacts. The contacts accept 18-22 AWG wire.

When corresponding with TE Personnel, use the terminology provided on this specification to help facilitate your inquiry for information. Basic terms and features of components are provided in Figure 1.

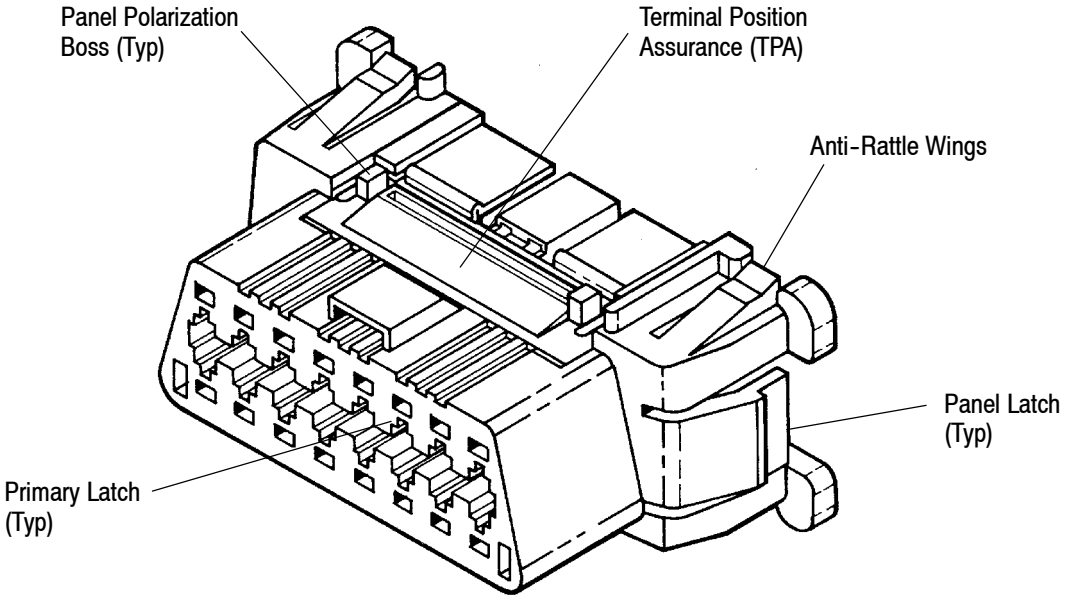


Figure 1

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:

- Added note number 5 to bottom of Figure 2.

2.2. Customer Assistance

Reference Base Part Numbers 179631, 1456728, and Product Code 2153 are representative numbers of the Automotive On-Board Diagnostic Connector. 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 the Product Information Center number at the bottom of this page.

2.3. Drawings

Customer Drawings for specific products are available from the responsible TE Engineering Department via the service network. The information contained in the Customer Drawing takes priority if there is a conflict with this specification or with any other technical documentation supplied by TE.

2.4. Product Specifications

Product Specification 108-1452 provides test and performance requirements.

2.5. Instructional Material

Document Number	Document Title
408-3295	Preparing Reel of Contacts for Application Tooling
408-3307	Automotive On-Board Diagnostic Connector 179631-1
408-7424	Checking Terminal Crimp Height or Gaging Die Closure
408-8040	Heavy Duty Miniature Quick-Change Applicators (Side-Feed Type)
408-8059	General Preventative Maintenance for Applicators
408-9640	Crimp Quality Monitors Applicators for Side-Feed and End-Feed Applications
408-9816	Handling of Reeled Products
409-5842	AMP-O-LECTRIC* Model "G" Terminating Machine 354500-[ ]
409-10016	Entry Level Terminator (ELT) Machine 1338600-[ ]
409-10027	Stripping Modules 1490500 and 1490502
409-10029	Stripping Modules 1490501 and 1490503

3. REQUIREMENTS

3.1. Storage

A. Ultraviolet Light

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

B. Reel Storage

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

C. Shelf Life

The components should remain in the shipping containers until ready for use to prevent deformation. The components 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 if available.

3.2. Polarization

The connector is polarized by the "D" shaped geometry. Polarization to the panel is achieved by two polarization bosses on the top of the housing.

3.3. Wire Selection and Preparation

A. Selection

Contacts are available for the wire sizes specified in the table in Figure 2.

B. Strip Length

Insulation shall be stripped as indicated in Figure 2.

3.4. Socket Crimping

To ensure proper contact crimping, it is recommended that application tooling be used with a Crimp Quality Monitor. This equipment not only provides a system approach (product and tooling from the same manufacturer), but also provides immediate feedback in the event that a faulty crimp is produced.

3.5. Crimp Requirements

A. The carrier cutoff tab shall be cut to the dimensions shown in Figure 2. The burr on the cutoff tab shall not exceed the dimension shown in Figure 2.

B. The crimp height and width information is found in the table in Figure 2.

C. The wire barrel flash shall not exceed the dimensions shown in Figure 2 in Section X–X.

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

E. The front and rear bellmouths shall be evident and conform to the dimensions given in Figure 2.

F. After crimping, the conductor shall be flush with the front end of the wire barrel or protrude beyond the wire barrel to the maximum shown in Figure 2.

G. After crimping, the wire conductor and insulation must be visible between the wire and insulation barrels. Care shall be taken not to allow insulation to be crimped in the wire barrel.

H. Wire strands must be pushed down inside contact transition area equal to or below the crimp height.

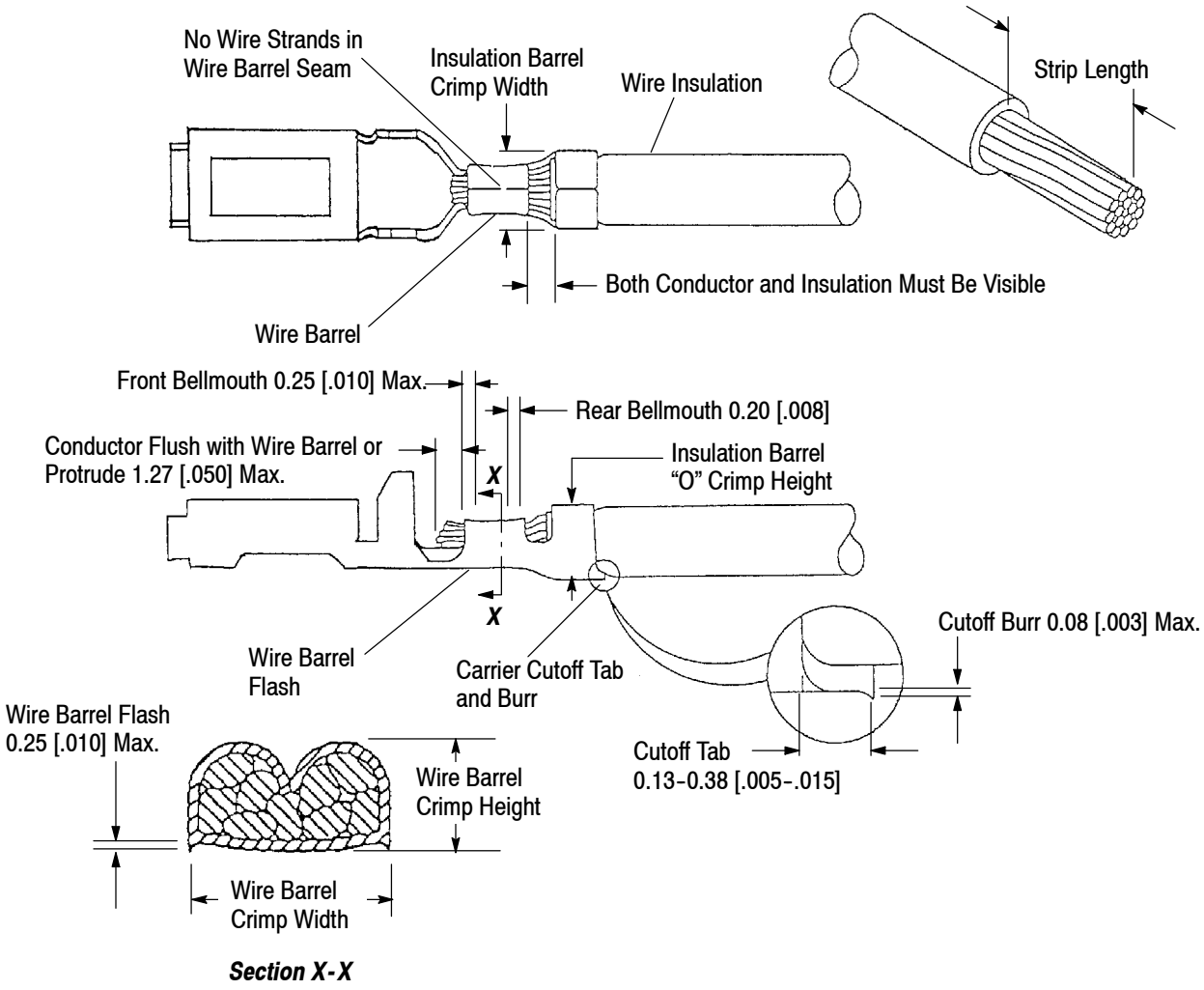


Figure 2 (cont'd)

WIRE				WIRE BARREL CRIMP		INSULATION BARREL CRIMP		CRIMP TENSILE
mm^2	AWG	INSULATION DIAMETER	STRIP LENGTH	HEIGHT ±0.05 [.002]	WIDTH (REF)	WIDTH	"O" CRIMP HEIGHT	Kg (Min) (3 sigma)
0.3	22	1.10-1.90 [.043-.075]	3.20-3.95 [.126-.156]	1.07 [.042]	1.78 [.070]	2.54 ±0.13 [.100 ±.005]	2.46 [.097] (Max)	6
0.5	20	1.30-2.25 [.051-.089]		1.14 [.045]				8
0.8	18			1.24 [.049]				13

NOTE:
1. Crimp Tensile values may vary with wire construction and style
2. Crimp Tensile strength includes insulation grip.
3. For CAVUS (compressed conductor wire) contact TE Automotive Product Engineering.
4. "F" type insulation crimp is optional: contact TE Automotive Product Engineering.
5. Overlap ("OV" type) insulation crimp is permissible.

Figure 2 (end)

I. The contact, including the cutoff tab and burr, shall not be bent above or below the datum line more than the amount shown in Figure 3. The side-to-side bending of the contact shall not exceed the limits specified. There shall be no twist or roll in the crimped portion that will impair usage of the contact.

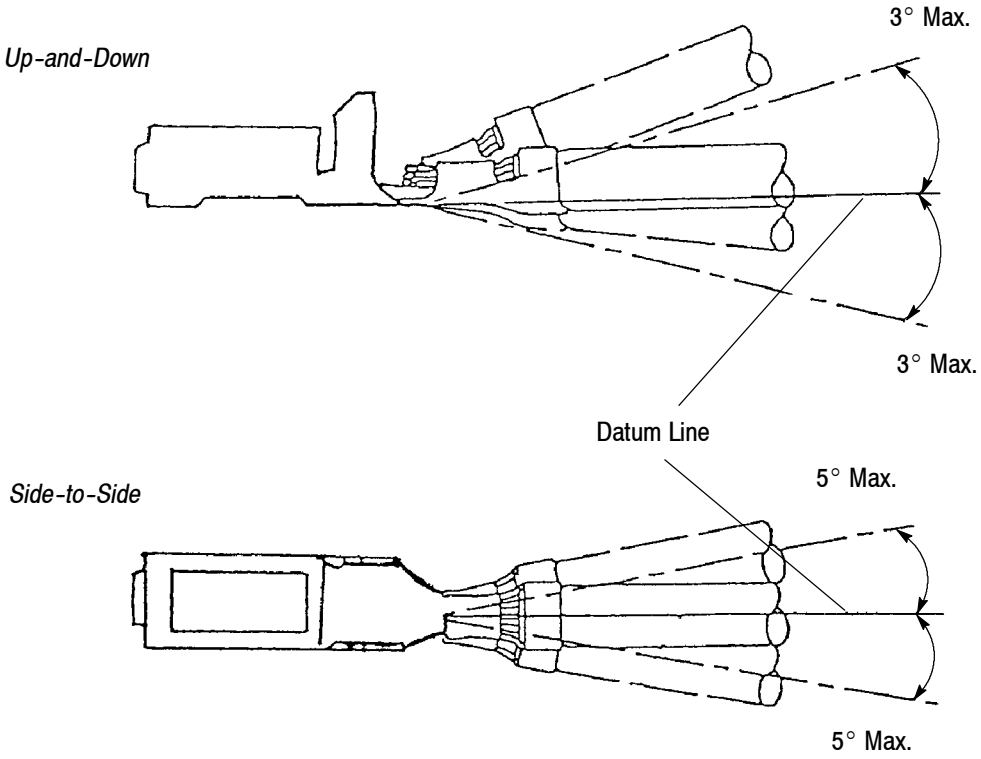


Figure 3

3.6. Assembly Procedures

Check to be sure the connector is in the open, or as-shipped, position, see Figure 4 (a). Then, proceed as follows:

1. Align a terminated contact with the appropriate circuit cavity in the connector (with contact legs positioned as shown).
2. Push the contact straight into the cavity as far as it will go.
3. Pull back on the contact wire slightly to be sure it is locked in position.
4. After all required contacts have been inserted, close and lock the Terminal Position Assurance (TPA) by pushing it forward until it snaps in place. See Figure 4 (b).

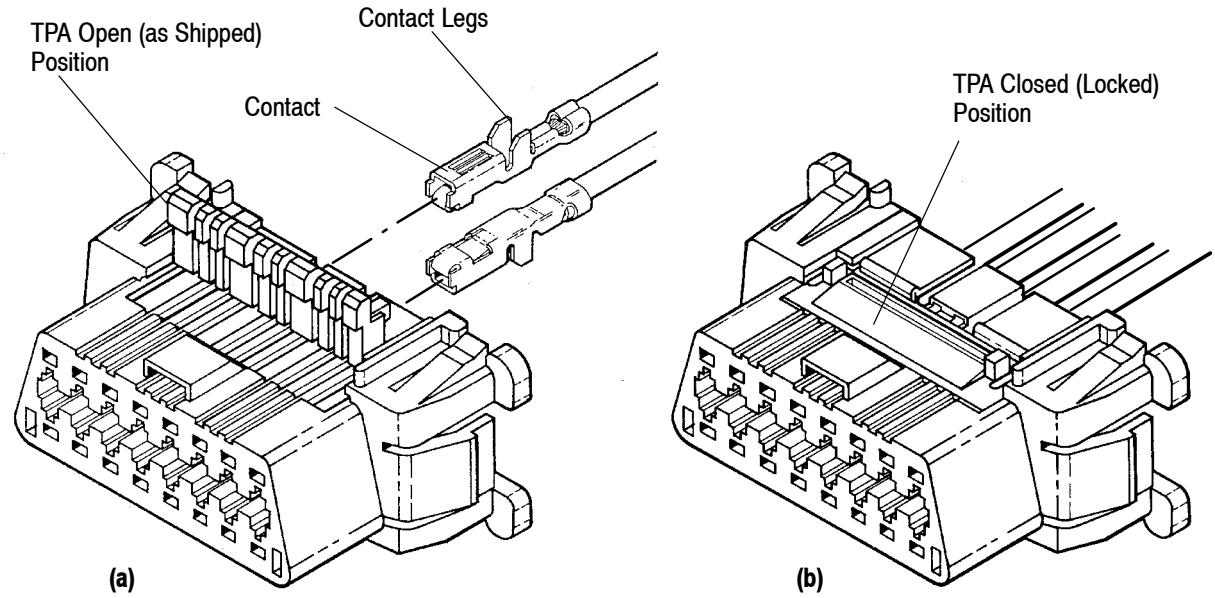


Figure 4

3.7. Panel Mounting

Polarization to the panel is achieved by two polarization bosses on the top of the housing. The connector is inserted through the panel until the panel latches snap into place. Refer to Customer Drawing 179631 for panel cut-out dimensions.

3.8. Repair

Damaged wires or contacts can be removed from the connector and replaced. Refer to Instruction Sheet 408-3307 for procedures on disengaging the secondary lock and the primary latch in the housings.

4. QUALIFICATION

The On-Board Diagnostic Connector is Qualified to the SAE Recommended Practice J-1962, Diagnostic Test connector.

5. TOOLING

Figure 5 provides tool part numbers and instructional material related to wire size for the On-Board Diagnostic Connector Contacts.

NOTE

TE Tooling Engineers have designed machines for a variety of application requirements. For assistance in setting up prototype and production line equipment, contact TE Tool Engineering through your local TE Representative or call the Tooling Assistance Center number at the bottom of page 1.

- **Applicator**

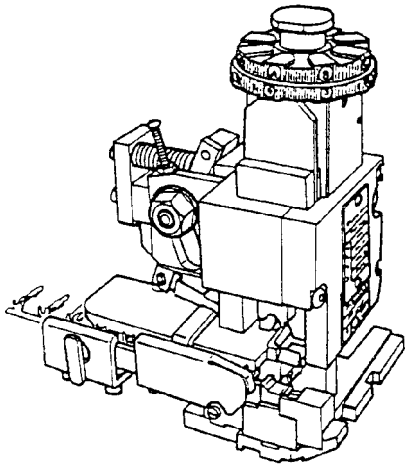
  Applicators are designed for the full wire size range of strip-fed, precision formed contacts, and provide for high volume, heavy duty, production requirements. The applicators can be used in bench or floor model power units.

NOTE

Each applicator is shipped with a metal identification tag attached. DO NOT remove this tag or disregard the information on it. Also, a packet of associated paperwork is included in each applicator shipment. This information should be read before using the applicator; then it should be stored in a clean, dry area near the applicator for future reference. Some changes may have to be made to the applicators to run in all related power units. Contact the Tooling Assistance Center number located at the bottom of page 1 for specific changes.

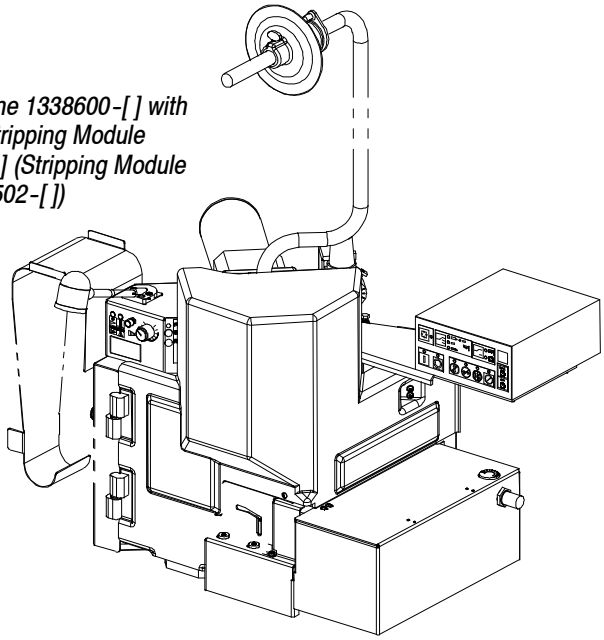
- **Power Units**

  A power unit is an automatic or semi-automatic device used to assist in the application of a product. Power unit includes the power source used to supply the force or power to an applicator.

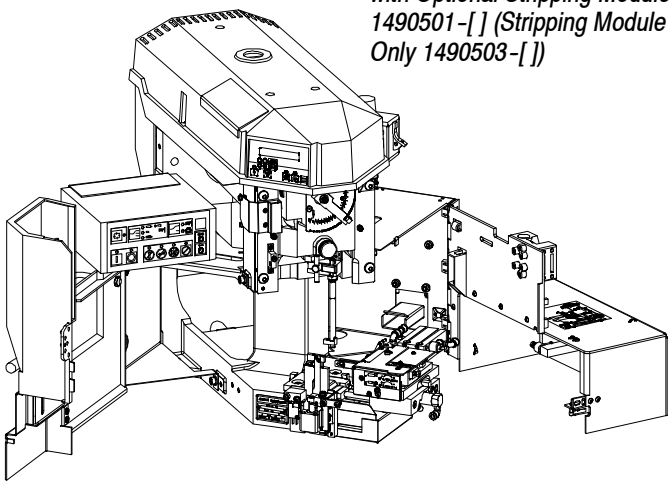


Typical Quick-Change Miniature Applicator

ELT Machine 1338600-[ ] with Optional Stripping Module 1490500-[ ] (Stripping Module Only 1490502-[ ])



AMP-O-LECTRIC Model "G" Terminating Machine 354500-[ ] with Optional Stripping Module 1490501-[ ] (Stripping Module Only 1490503-[ ])



WIRE SIZE, AWG	APPLICATOR (408-8040)	POWER UNIT (DOCUMENT)
18-22	567467-2	1338600-3, -4 (409-10016)
	6-576099-2, 6-576099-7	576879-1 (N/A)
		354500-1 (409-5842)

Figure 5

6. VISUAL AID

Figure 6 shows a typical application of an On-Board Diagnostic Connector and Contact. The illustrations are to be used by production personnel to ensure properly applied product. The views suggest requirements for good applications. Applications considered visually incorrect should be inspected using the information in the main body of the main body of this document.

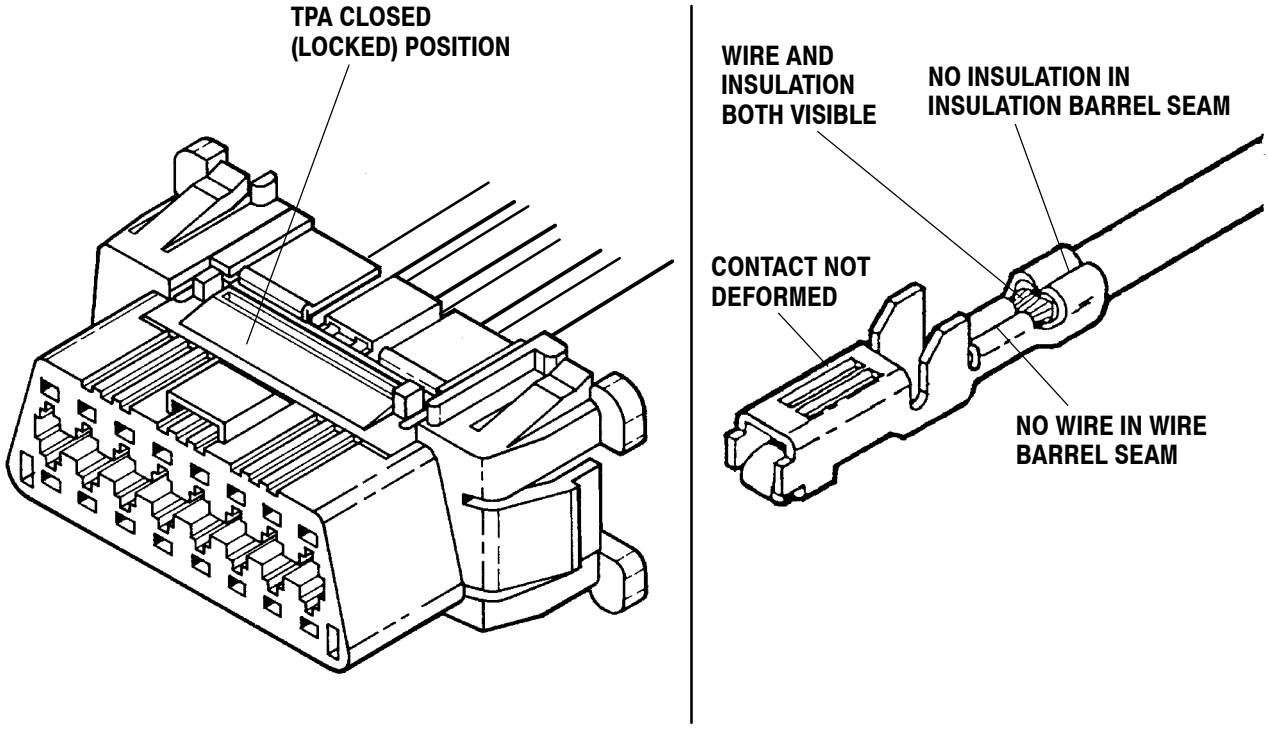


FIGURE 6. VISUAL AID