

UNSIGNED HARDCOPY  
NOT CONTROLLED



Instruction  
Hardware Engineering

No. LMS 11-9

**SUBJECT:** Solderless (Crimp-Type) Terminations

**APPROVED BY** Manager, Hardware Engineering

**STATUS** Maintenance Revision

**PURPOSE** General requirements for crimp-type terminations are covered in this instruction. For taper pins, refer to **LMS 11-5**, and for termination of shielded and coaxial wire, see **LMS 11-18**. Requirements of this instruction shall be followed by L-3 Communications Corporation, Link Simulation & Training Division (hereafter referred to as Link) personnel when making solderless (crimp-type) terminations.

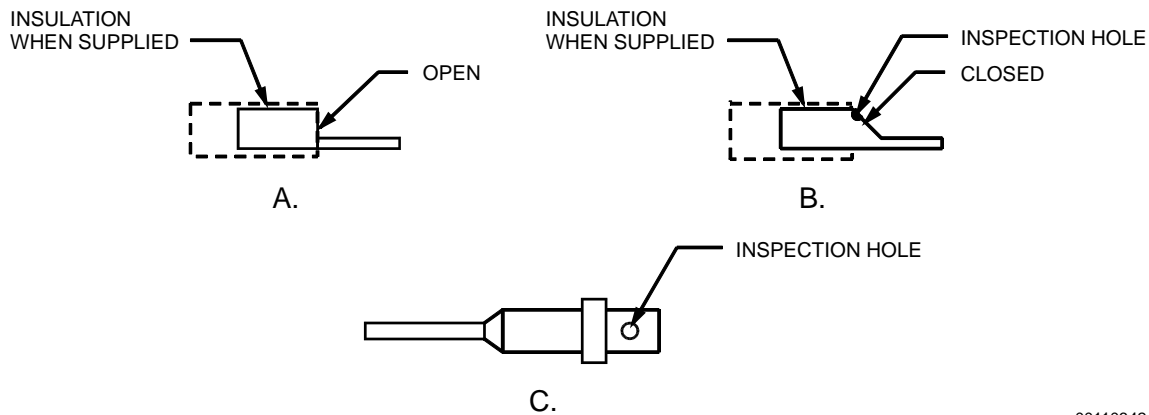
**AFFECTED FUNCTIONS** Hardware Engineering  
Manufacturing

**REFERENCES** **LMS 11-4** Stripping of Wire  
**LMS 11-5** Taper Pins  
**LMS 11-18** Shielded Wire and Coaxial Cable Assemblies  
MIL-HDBK-454 General Guidelines for Electronic Equipment

**DEFINITIONS** None

**INSTRUCTION**

1. Requirements
  - 1.1 Terminals and lugs. Terminals are classified by the wire barrel design. Common crimp-type terminals are shown in Figure 1.
    - a. Open end - insulated and uninsulated (part A of Figure 1).
    - b. Closed end - insulated and uninsulated (part B of Figure 1).
    - c. Closed end - uninsulated connector contacts (part C of Figure 1).



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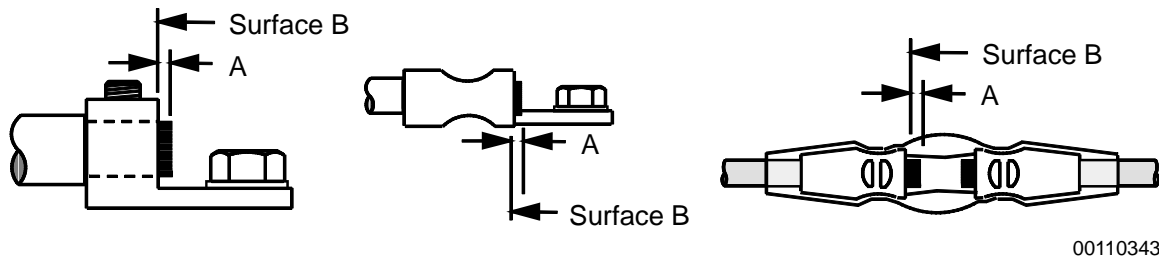
**Figure 1 Crimp-Type Terminations**

Wire size. The lug shall be compatible with the size of the wire being terminated. Most lugs are designed to accept a range of wire sizes. For example: the red lug (MS25036-102, REF.) may have 22-18 stamped on the tab, indicating it will accept 22 through 18 AWG wire. The red marking is used as an aid in selecting the proper crimping tool. (See paragraph 1.9a., color coding.)

- 1.2 Wire. Crimp-type terminations covered in this instruction are designed for use with insulated stranded wire.

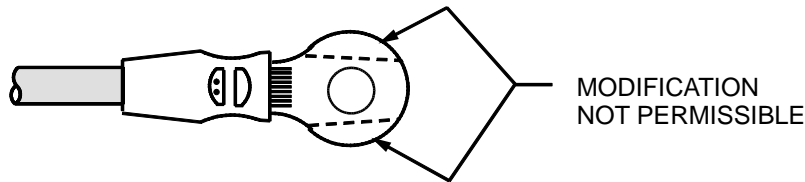
Wire stripping. The insulation shall be removed from the conductor squarely and in a manner that will preclude nicking or other damage to the stranded conductor. See [LMS 11-4](#) for proper techniques of stripping wire.

- 1.3 Wire insertion. Wire shall be prepared as defined in paragraph 1.2 above.
- a. Open ended, insulated, and uninsulated. The wire shall be inserted so that the insulation is firmly against the barrel end or insulation support. Dimension "A" (Figure 2) shall be kept to a minimum. In no case shall the wire extend far enough to come into contact, or interfere, with the terminal mounting nut or screw head. The wire shall not be recessed into the lug. It shall be at least flush with the end of the barrel (surface B).



**Figure 2 Wire Insertion**

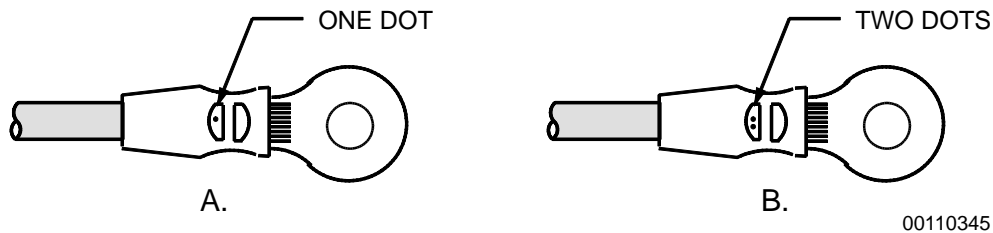
- b. Closed end, insulated, and uninsulated. Wire shall be inserted into the barrel of the terminal so that the insulation abuts the barrel end or is within the insulation support cup. The end of the conductor shall be visible through the inspection hole both before and after the crimping operation. (See part B of Figure 1.)
  - c. Closed end, uninsulated connector contacts. The wire shall be inserted into the crimp barrel so that the wire end is visible through the wire inspection hole. (See part C of Figure 1.) The insulation shall abut the barrel or enter the insulation support cup (when supplied). The contact shall be crimped to the wire using the proper full cycle (ratchet-type) crimping tool. After this operation, the conductor end will still be visible through the inspection hole.
- 1.4 Splices and ferrules. The requirements for insulated and uninsulated (open and closed) end terminals shall also apply to splices and ferrules.
- 1.5 Electrical connector contacts. Electrical connector contacts are of the uninsulated closed-end category with or without insulation support. Wire shall be prepared as defined in paragraph 1.1b, inserted and crimped as defined in paragraph 1.3c.
- 1.6 Terminals shall not be modified so as to decrease the contact area. (See Figure 3.) The terminal ring may be bent slightly to facilitate lead dress in the final assembly.



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**Figure 3 Terminal Modification**

- 1.7 Dot coding. The following dot coding will appear on the top of AMP PIDG-type terminations when they are properly crimped.
- One dot on 26-24 (color code yellow) and 22-18 (color code red) terminations. See part A of Figure 4.
  - Two dots on 24-20 (color code white) and 16-14 (color code blue) terminations. See part B of Figure 4.

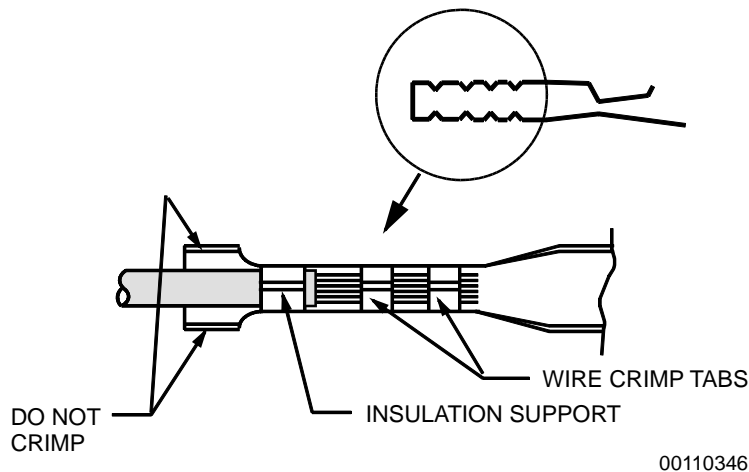


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**Figure 4 Terminal Dot Coding**

Observe the dot code on the finished crimp to insure correct product and die closure was used. The location of these dots may vary with different type terminals.

- 1.8 AMP miniature dual-latch contacts, crimp-type. The wire shall be positioned and crimped in the contact as illustrated in Figure 5. Note that the end tabs on the contact serve as terminal stops and are not crimped.



**Figure 5 Contact Crimping**

- 1.9 Crimping tool. There may be more than one correct crimping tool for a particular lug or terminal. The following considerations shall be used in selecting the proper crimping tools.
- Color coding. The proper crimping tools shall have either a colored dot or arrow next to the slot for crimping the terminal. The colored dot shall match the color of the lug being crimped. Some crimping tools may have actual wire range stamped next to the slot, such as “22-18 AWG”, which shall match the wire size being crimped.
  - Insulation crimp. Most crimping tools have an adjustment to compensate for at least three different insulation thicknesses. Position 1 will crimp the insulation the tightest. The insulation shall be crimped tight enough to give support and not damage the wire.
- 1.10 Automatic machine crimp. Before each machine usage, a test sample shall be made and gauge tested using a crimp height gauge to assure proper crimp. (Test only required once a day when the machine is being used).

The operator shall log the test results into the machine log for each test.

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2. Quality Assurance Provisions
  - 2.1 Quality Assurance Organization shall be responsible for monitoring and performing all necessary tests to assure that all crimped terminations conform to MIL-HDBK-454, and the requirements set forth in this document.
3. Preparation For Delivery (Not Applicable)