

**PRODUCT SPECIFICATION**

**1. SCOPE**

**1.1. Content**

This specification covers the performance, tests and quality requirements for the AMP\* 2 wire, 3 wire and half-tap Tel-Splice domestic and international connectors. They are used for splicing telephone cable conductors or other insulated solid copper communication wires.

**1.2. Description**

Connectors consist of 2 mating hard shell plastic housings with wire entry ports. Attached to the upper housing is a "U" shaped contact with wire contact slots, 2 for each wire as applicable. The lower housing contains the wire stuffing means which forces the wires into the contact slots when the 2 housings are depressed together.

**1.3. Qualification**

When tests are performed on the subject product line, the procedures specified in AMP 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

**2. APPLICABLE DOCUMENTS**

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

**2.1. AMP Documents**

- A. 109-1: General Requirements for Test Specifications
- B. 109 Series: Test Specifications as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
- C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Military or Commercial Documents
- D. 114-6010 : Application Specification
- E. 501-88 : Test Report

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Product Code: 1216

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				NO 108-6021	REV F LOC B
F	Revise per ECN AA-7008	<i>FR</i>	7/9/90	PAGE 1 OF 7	TITLE CONNECTOR, TEL-SPLICE
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### 3. REQUIREMENTS

#### 3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

#### 3.2. Material

- A. Terminal:
  - (1) Phosphor bronze, tin plated, domestic
  - (2) Brass, tin plated, international
- B. Housing: Polypropylene, UL 94-H.B.

#### 3.3. Rating

- A. Operating temperature range: -40° to 90°C
- B. Operating voltage: 400 vdc

#### 3.4. Performance and Test Description


Connectors shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

#### 3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of Product	Meet requirements of product drawing and AMP Spec 114-6010.	Visual, dimensional and functional per applicable inspection plan.
<b>ELECTRICAL</b>		
Termination Resistance, Dry Circuit	30 milliohms maximum initial. $\Delta R = 2.0$ milliohms maximum final.	Subject connectors mounted on printed circuit boards to 50 mv - open circuit at 50 ma maximum, see Figure 3; AMP Spec 109-6-3
Dielectric Withstanding Voltage	2.5 kvac minimum dielectric withstanding voltage.	Test between samples and copper electrode immersed in 5% salt solution, apply voltage at a rate of 500 volts per second to 8 kv or breakdown occurs; AMP Spec 109-6005

Figure 1 (cont)

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Test Description	Requirement	Procedure									
Insulation Resistance/ Immersion	100 megohms minimum insulation resistance.	Subject connectors to 5 cycles of immersion in 5% salt solution at a depth of 2 inches, each cycle shall be 72 hours of immersion followed by 72 hours at ambient. Readings shall be taken initially and at the end of the last cycle. Use a test potential of 250 vdc; AMP Spec 109-74-4, cond D.									
<b>MECHANICAL</b>											
Tensile	75% of mean wire breaking strength minimum.	Determine tensile between 2 conductors at a rate of 1 inch/minute, see Figure 4; AMP Spec 109-16.									
<b>ENVIRONMENTAL</b>											
Temperature Cycling	(a)	Subject connectors mounted on printed circuit boards to 512 cycles between -40° and 60°C; AMP Spec 109-75-1.									
Temperature Life, Heat Age (a)	(a)	Subject connectors mounted on printed circuit boards to 1000 hours at 100°C; AMP Spec 109-43, test duration D, except chamber temperature to be 100°C.									
<p>(a) Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in Figure 2.</p> <p style="text-align: center;">Figure 1 (end)</p>											
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### 3.6. Connector Test and Sequences

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Examination of Product	1	1	1	1	1
Termination Resistance, Dry Circuit	2,4	2,4			
Dielectric Withstanding Voltage				2	
Insulation Resistance/ Immersion (c)			2		
Tensile					2
Temperature Cycling		3			
Temperature Life, Heat Age	3				

(a) See Para 4.1.

(b) Numbers indicate sequences in which tests are performed.

(c) This test is for filled connectors only.

Figure 2

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1. Qualification Testing

#### A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Each test group or wire combination shall consist of 10 sample splices prepared with identical wire combinations. Each connector shall be applied utilizing the CERTI-CRIMP\* hand tool and Pic wire in accordance with the applicable AMP Specification 114-6010.

#### B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

### 4.2. Mounting of Samples to Test Board

A. Samples and equivalent lengths of wire (unspliced conductors) scheduled for termination resistance millivolt drop measurements shall be mounted onto printed circuit boards to facilitate automated readout and to prevent any movement during handling that could distort the millivolt drop measurement.

B. Tel-Splice connector samples shall be mounted to the sample mounting boards as shown in Figure 5. The following procedures shall apply:

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(1) Wires

- (a) Wires shall be stripped to within .25 inch of solder connection.
- (b) Wires shall be bent 90° prior to insertion in printed circuit wiring holes.
- (c) Wires shall be soldered to printed circuitry on both sides of the test board.

(2) Tel-Splice Connector

- (a) The Tel-Splice connector shall be located 1 inch from the printed wiring pads.
- (b) The Tel-Splice connector shall lie flat against the test board.

C. Acceptance

- (1) Test results from development on pre-qualification samples will be used to determine upper and lower one-sided statistical tolerance limits for 99% reliability at 95% confidence, as follows. Let  $\bar{X}$  and  $s$  denote the sample average and standard deviation, respectively, of the test data. Let  $k$  denote the normal distribution one-sided tolerance factor for 95% confidence and 99% reliability. The value of  $k$  varies with sample size. Values of  $k$  are given in various tables, for example, NBS Handbook 91, Factors for One-Sided Tolerance Limits for Normal Distribution. Suitability of the normal distribution for representing the data shall be verified with normal probability plots, goodness of fit tests, etc.

Then the upper one-sided tolerance limit for 99% reliability at 95% confidence is given by  $\bar{X} + ks$ . The interpretation of this tolerance limit is as follows: based on the test data, and assuming a normal distribution for the test data, we can be 95% confident that 99% of the population of values represented by the sample data will not exceed  $\bar{X} + ks$ . For any test parameter for which there is specified an upper requirement which is not to be exceeded, satisfactory performance of the product is achieved when the value of  $\bar{X} + ks$  does not exceed the requirement value.

The lower one-sided tolerance limit for 95% confidence and 99% reliability is given by  $\bar{X} - ks$ . This has a similar interpretation and corresponding application to lower requirement values.

- (2) Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

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#### 4.3. Requalification Testing

Requalification shall be established by the cognizant divisional engineering function and may consist of all or any part of the overall qualification program provided that it is conducted within the required time period.

#### 4.4. Quality Conformance Inspection

The applicable AMP inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

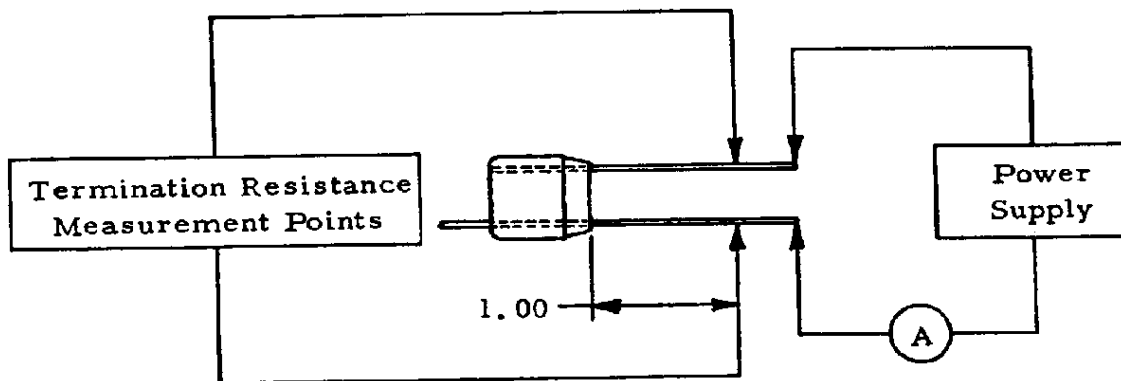


Figure 3  
Termination Resistance Measurement Points

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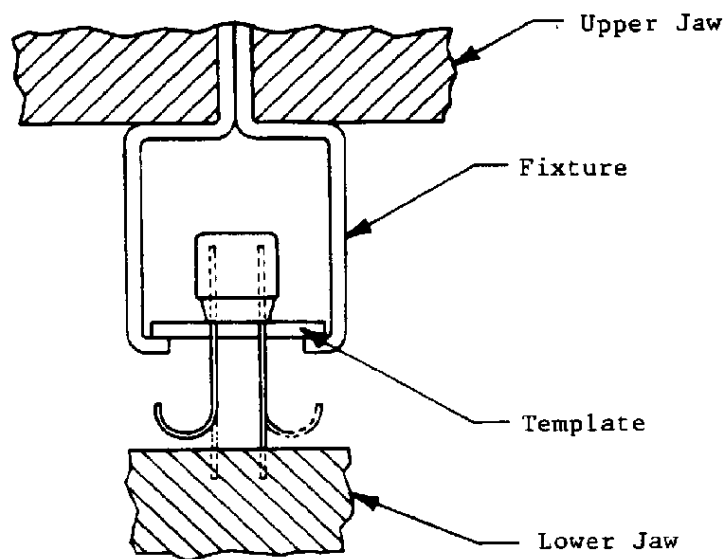
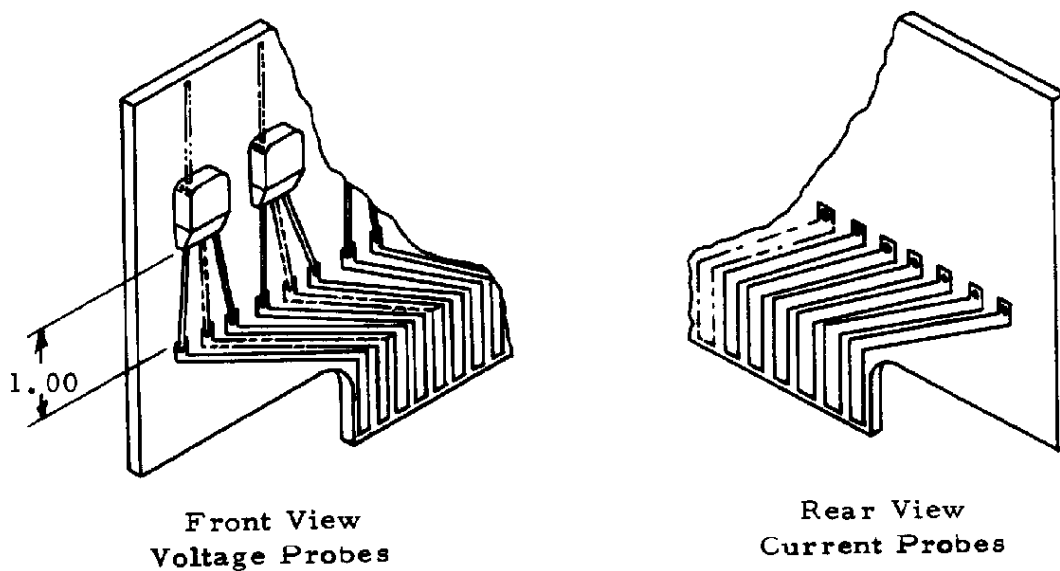


Figure 4  
Tensile Test Setup



Printed circuit paths are voltage and current probes

Figure 5  
Tel-Splice Connector Sample Mounting Board

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