

## PRODUCT SPECIFICATION

### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests and quality requirements for AMP\* Zero Entry connector of the AMP Cammed Rectangular (CR) series. This family of electrical connectors is designed for mating large numbers of contacts without excessive plating wear or degradation of contact spring members.

#### 1.2. Qualification

When tests are performed on subject product line, procedures specified in AMP 109 series specifications shall be used. All inspections shall be performed using 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 requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

#### 2.1. AMP Specifications

- 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. Instruction Sheets: 6699, 7674, 7784 and 9006
- E. 501-218: Test Report

#### 2.2. Commercial Standard

IPC-FC-222: Flat Cable, Round Conductor, Unshielded

#### 2.3. Military Specification

MIL-W-16878/1: Wire, Electrical, Polyvinyl Chloride, Insulated, 150 C, 600 Volts

\* Trademark

Product Code: 4983, 5088, 5098

|                                                                                                                                                                                                  |                                |            |         |                                                                                                                |                                                              |                                                          |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------|---------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------|----------|
| <b>CONTROLLED DOCUMENT</b><br>This specification is a controlled document per AMP Specification 102-21. It is subject to change and Corporate Standards should be contacted for latest revision. |                                |            |         | DR <i>Brent H. Beckley</i> 4/16/93<br>CHK <i>Steve B. Mammey</i> 4/29/93<br>APP <i>Cliff H. Mammey</i> 4/20/93 |                                                              | <b>AMP</b> AMP Incorporated<br>Harrisburg, PA 17105-3808 |          |
|                                                                                                                                                                                                  |                                |            |         | NO                                                                                                             | 108-10055                                                    | REV<br>0                                                 | LOC<br>B |
| 0                                                                                                                                                                                                | Release per EC<br>0600-0196-93 | <i>P/B</i> | 4/23/93 | PAGE<br>1 OF 7                                                                                                 | TITLE<br>CONNECTOR, ZERO ENTRY,<br>CAMMED RECTANGULAR SERIES |                                                          |          |
| LTR                                                                                                                                                                                              | REVISION RECORD                | APP        | DATE    |                                                                                                                |                                                              |                                                          |          |

### 3. REQUIREMENTS

#### 3.1. Design and Construction

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

#### 3.2. Materials

- A. Contact: Copper alloy, selective gold over nickel plating
- B. Housing: Thermoplastic
- C. Metal Frames: Aluminum alloy

#### 3.3. Ratings

- A. Voltage: 250 volts alternating current
- B. Current: Signal application only
- C. Temperature: -55 to 105°C

#### 3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. All tests are performed at ambient environmental conditions per AMP Specification 109-1 unless otherwise specified.

#### 3.5. Test Requirements and Procedures Summary

| Test Description                     | Requirement                                                  | Procedure                                                                                                                                   |
|--------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Examination of product.              | Meets requirements of product drawing.                       | Visual, dimensional and functional per applicable quality inspection plan.                                                                  |
| ELECTRICAL                           |                                                              |                                                                                                                                             |
| Termination resistance, dry circuit. | 25 milliohms maximum initial.<br>25 milliohms maximum final. | Subject mated contacts assembled in housing to 100 mv open circuit at 50 ma.<br>Calculate resistance.<br>See Figure 3.<br>AMP Spec 109-6-1. |
| Dielectric withstanding voltage.     | 1000 vac at sea level.<br>No breakdown or flashover.         | Test between adjacent contacts of mated connector assemblies.<br>AMP Spec 109-29-1.                                                         |
| Insulation resistance.               | 5000 megohms minimum initial.<br>1000 megohms minimum final. | Test between adjacent contacts of mated connector assemblies.<br>AMP Spec 109-28-4.                                                         |

Figure 1 (cont)

**AMP**

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PAGE NO

2

108-10055

REV

0

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B

| Test Description                      | Requirement       | Procedure                                                                                                                                                                                               |
|---------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MECHANICAL</b>                     |                   |                                                                                                                                                                                                         |
| Vibration, sinusoidal, low frequency. | See Note (a).     | Subject mated connectors to 10-55-10 Hz traversed in 1 minute at .06 inch total excursion. 2 hours in each of 3 mutually perpendicular planes.<br>AMP Spec 109-21-1.                                    |
| Physical shock.                       | See Note (a).     | Subject mated connectors to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.<br>AMP Spec 109-26-1. |
| Contact retention.                    | 5 pounds maximum. | Apply axial load of 5 pounds to contacts in insertion direction.<br>AMP Spec 109-30.                                                                                                                    |
| Durability.                           | See Note (a).     | Mate and unmate connector assemblies for 5000 cycles at maximum rate of 1000 cycles per hour.<br>AMP Spec 109-27.                                                                                       |
| <b>ENVIRONMENTAL</b>                  |                   |                                                                                                                                                                                                         |
| Thermal shock.                        | See Note (a).     | Subject mated connectors to 5 cycles between -55 and 105°C.<br>AMP Spec 109-22.                                                                                                                         |
| Humidity-temperature cycling.         | See Note (a).     | Subject mated connectors to 10 humidity-temperature cycles between 25 and 65°C at 95% RH.<br>AMP Spec 109-23-3, Condition B.                                                                            |
| Mixed flowing gas.                    | See Note (a).     | Subject mated connectors to environmental class II for 14 days.<br>AMP Spec 109-85-2.                                                                                                                   |
| Temperature life.                     | See Note (a).     | Subject mated connectors to temperature life at 105°C for 1000 hours.<br>AMP Spec 109-43.                                                                                                               |

(a) Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 2.

Figure 1 (end)

|            |                                               |      |           |     |     |
|------------|-----------------------------------------------|------|-----------|-----|-----|
| <b>AMP</b> | AMP Incorporated<br>Harrisburg, PA 17105-3608 | PAGE | NO        | REV | LOC |
|            |                                               | 3    | 108-10055 | 0   | B   |

### 3.6. Connector Qualification and Requalification Tests and Sequences

| Test or Examination                 | Test Group (a)    |      |      |     |
|-------------------------------------|-------------------|------|------|-----|
|                                     | 1                 | 2    | 3    | 4   |
|                                     | Test Sequence (b) |      |      |     |
| Examination of product              | 1,8               | 1,5  | 1,5  | 1,8 |
| Termination resistance, dry circuit | 2,6               | 2,4  | 2,4  |     |
| Dielectric withstanding voltage     |                   |      |      | 3,7 |
| Insulation resistance               |                   |      |      | 2,6 |
| Vibration                           | 4                 |      |      |     |
| Physical shock                      | 5                 |      |      |     |
| Contact retention                   | 7                 |      |      |     |
| Durability                          | 3                 |      |      |     |
| Thermal shock                       |                   |      |      | 4   |
| Humidity-temperature cycling        |                   |      |      | 5   |
| Mixed flowing gas                   |                   |      | 3(c) |     |
| Temperature life.                   |                   | 3(c) |      |     |

(a) See Para 4.1.A.

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

(c) Precondition with 10 cycles durability.

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 and shall be selected at random from current production. Test group 1 shall consist of 2, 156 position and 2, 120 position connector systems, which shall be selectively loaded, wired, and electrically monitored in accordance with Figures 4 and 5 respectively. Test groups 2 and 3 shall each consist of 2, 156 position connector systems loaded with posted type contacts. Test group 4 shall consist of 5, 156 position connector systems loaded with posted type contacts. Contacts using discrete wire shall be terminated to approximately 18 inches of wire conforming to MIL-W-16878/1. Connector modules utilizing ribbon cable shall be terminated to approximately 18 inches of ribbon cable conforming to IPC-FC-222.

#### B. Test Sequence

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

### 4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

**AMP**

AMP Incorporated  
Harrisburg, PA 17105-3608

PAGE NO

4

108-10055

REV LOC

0

B

#### 4.3. Acceptance

Acceptance is based on verification that product meets requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

#### 4.4. Quality Conformance Inspection

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

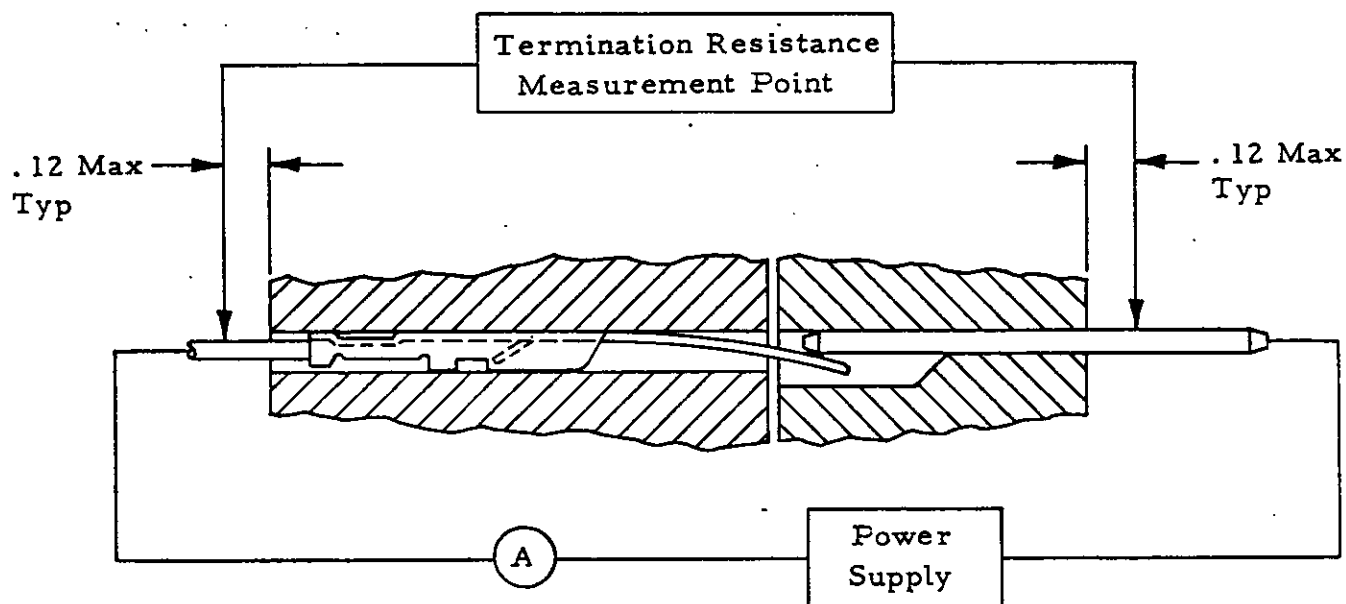
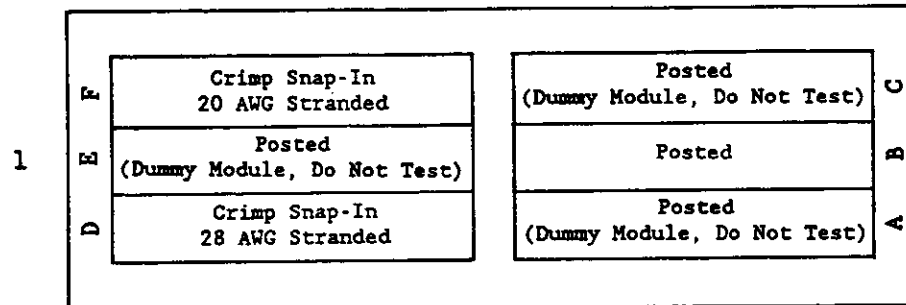
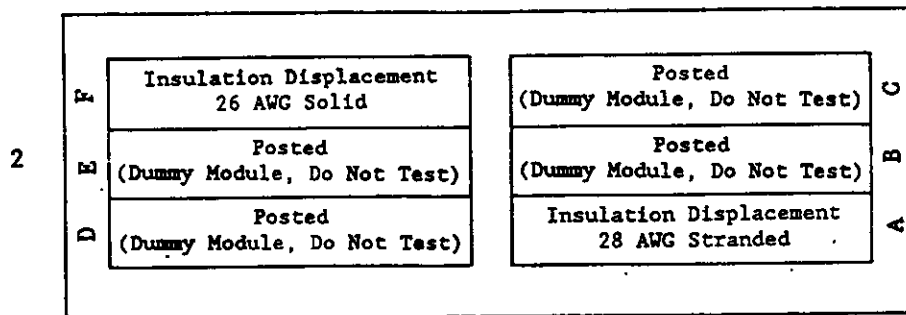
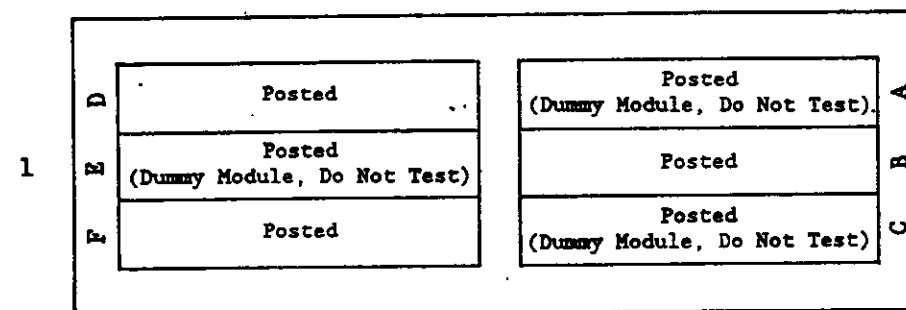
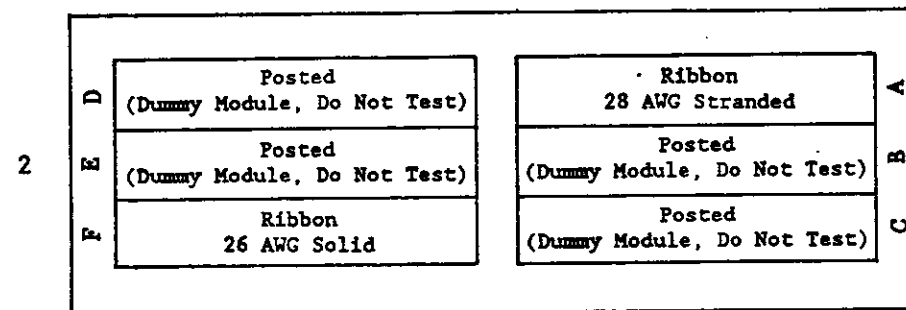


Figure 3  
Termination Resistance Measurement Points

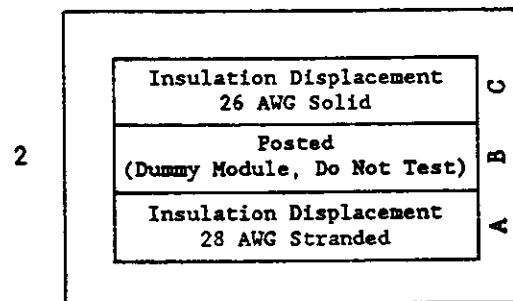
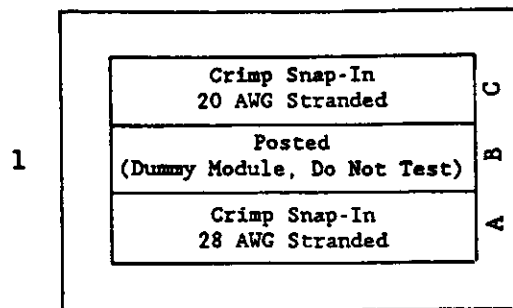


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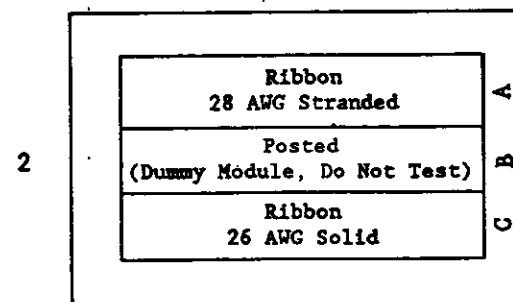
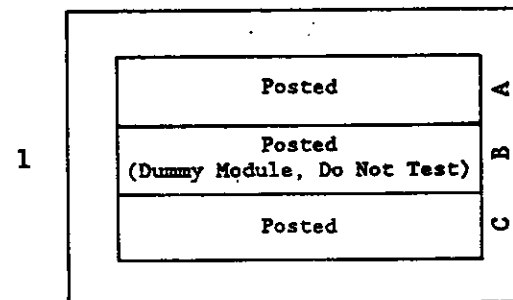


### RECEPTACLES

Figure 4  
Module Loading Sequence, 156 Position Connector System  
(Mating Face Of Connector Is Shown)



#### PLUGS



#### RECEPTACLES

Figure 5  
Module Loading System, 120 Position Connector System  
(Mating Face Of Connector Is Shown)