PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the AMP* single circuit breakaway connectors:

| | | |
|---|---|---|
| Medical Splice | Pin connector | Sealed |
| | Socket connector | Sealed |
| Style 1/5 | Pin connector | Unsealed |
| | Socket connector | Unsealed |
| Style 5/15 | Pin connector | Sealed |
| | Socket connector | Sealed |
| Style 25/35 | Pin connector | Unsealed |
| | Socket connector | Unsealed |

1.2. 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
E. 501-87 : Test Report

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Product Code: 5012



| LTR | REVISION RECORD | APP | DATE |
|---|---|---|---|
| A | Release per ECN BD-2891 | FR | 3/15/89 |

DR Fred Rumbaugh 3/15/89
CHK A Bagliani 3/15/89
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NO 108-10003 | REV A | LOC B

PAGE 1 OF 10

TITLE CONNECTOR, BREAKAWAY

3. REQUIREMENTS

3.1. Design and Construction

Breakaway connectors shall be of the design, construction and physical dimensions specified on the applicable product drawings.

3.2. Materials

A. Contacts:
(1) Socket, leaded commercial bronze and beryllium copper plated gold over nickel.
(2) Pin, leaded commercial bronze and beryllium copper plated gold over nickel.

B. Housings: Nylon

C. Grommet, Sealing plug and O Ring: Neoprene

3.3. Ratings

A. Voltage/Current: 1000 vac at 7.5 amperes maximum
B. Operating Temperature: -40° to 105°C

3.4. Performance and Test Description

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

3.5. Test Requirements and Procedures Summary

| Test Description | Requirement | Procedure |
|---|---|---|
| Examination of Product | Meet requirements of product drawing | Visual, dimensional and and functional per applicable inspection plan. |
| ELECTRICAL | | |
| Termination Resistance, Specified Current | Wire Size, AWG / Test Current amperes / Resistance, milliohms maximum<br>20 / 7.5 / 25<br>26 / 2.0 / 25<br>12 / 23 / 15<br>14 / 17 / 15 | Measure potential drop of mated contacts assembled in housing, see Figure 5; AMP Spec 109-25, calculate resistance |

Figure 1 (cont)

| Test Description | Requirement | Procedure |
|---|---|---|
| Termination Resistance, Dry Circuit | See specified current resistance values. | Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum, see Figure 5; AMP Spec 109-6-1. |
| Dielectric Withstanding Voltage | 1.5 kvac dielectric withstanding voltage, 1 minute hold, 1 milliampere maximum leakage current. | Test between contacts of mated connector assemblies and exterior of pin sleeve; AMP Spec 109-29-1 |
| Insulation Resistance | 5,000 megohms minimum initial. | Test between contacts of mated connectors and exterior of pin sleeve; AMP Spec 109-28-4. |
| Temperature Rise vs Current | Maximum temperature rise at specified current, 30°C Reference Figure 2. | Measure temperature rise vs current; AMP Spec 109-45-1. |
| MECHANICAL | | |
| Vibration, Sinusoidal Low Frequency | No discontinuities greater than 10 microseconds. See note (a) | Subject mated connectors to 10-55-10 Hz traversed in 1 minute at .06 inches total excursion; 2 hours in each of 3 mutually perpendicular planes; AMP Spec 109-21-1. 100 ma current applied. |
| Physical Shock | No discontinuities greater than 10 microseconds. See note (a) | Subject mated connectors to 50 G's sawtooth in 11 microseconds; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks; AMP Spec 109-26-7. |

Figure 1 (cont)

| Test Description | Requirement | Procedure |
|---|---|---|
| Mating and Unmating Force<br>Sleeves (housing) are lubricated with vaseline per product drawing.<br>DO NOT REMOVE | Style / Force, Pounds Min. unmating / Max. mating<br>Med.Sp. .5 10<br>1/5 .5 10;<br>5/15 1 15<br>25/35 5 35 | Measure force necessary to mate/unmate connector assembly, incorporating free floating fixtures, at a rate of .5 inch/ minute; AMP Spec 109-42, cond. A. |
| Contact Retention | Contact shall not dislodge a distance greater than .015 after load is removed. | Apply an axial load of 8 pounds tomating end of contacts; AMP Spec 109-30. |
| Durability | See note (a) | Mate and unmate connector assemblies for 100 cycles at a maximum rate of 500 cycles/hour; AMP Spec 109-27. |
| ENVIRONMENTAL | | |
| Thermal Shock | See note (a) | Subject mated connectors to 10 cycles between -40° and 105°C; AMP Spec 109-22 |
| Humidity-Temperature Cycling | 1000 megohms min. final insulation resistance.<br>See note (a) | Subject mated connectors to 10 humidity-temperature cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, method III, cond B. |
| Industrial Mixed Flowing Gas | Termination Resistance, dry circuit.<br>See note (a) | Precondition connectors to 10 durability cycles Subject mated connectors to environmental class II for 7 days; AMP Spec 109-85-2. |
| Temperature Life | See note (a) | Precondition connectors to 10 durability cycles. Subject mated connectors to temperature life; AMP Spec 109-43, test level 10, (105°C) test duration A, (96 hours). |

Figure 1 (cont)

| Test Description | Requirement | Procedure |
|---|---|---|
| Fluid Immersion<br>Sealed Connectors Only | See note (a) | Immerse mated connectors in 5% salt solution for 15 minutes minimum at 25°C; AMP Spec 109-33, cond Z. |
| Medical Splice Connectors Only | See note (a) | Immerse unmated connectors for 5 minutes<br>5 pair in blood<br>5 pair in urine<br>5 pair in 5% salt water, hang to drain sleeves and contacts, allow to dry for 6 hours. Mate the 15 pairs; AMP Spec 109-33, cond. Z. |

(a) Shall remain mated and show no evidence of damage, cracking or chipping.

Figure 1 (end)

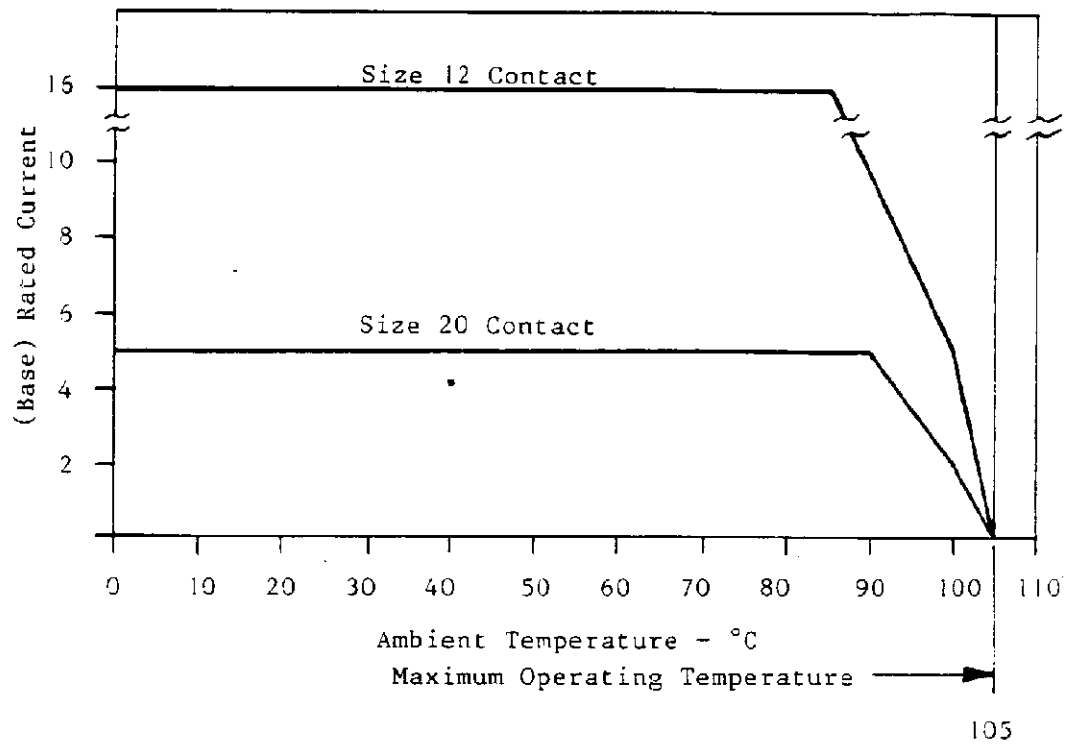
Size 12 Contact
Size 20 Contact
(Base) Rated Current
15
10
8
6
4
2
0
10
20
30
40
50
60
70
80
90
100
110
Ambient Temperature - °C
Maximum Operating Temperature
105

Figure 2A

| AWG / % | 26 | 20 | 14 | 12 | |
|---|---|---|---|---|---|
| Single Contact | 2.0 | 7.5 | 17 | 23 | 1 |

Figure 2B

3.6. Breakaway Qualification and Requalification Test Sequence

| Test or Examination | Test Group (a)(c)(d) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | Test Sequence (b) | | | | | | | | | |
| Examination of Product | 1,9 | 1,6 | 1,6 | 1,10 | 1,6 | 1,8 | 1,5 | 1,5 | 1,8 | 1,8 |
| Termination Resistance, Specified Current | | | | 2,8 | | | | | | |
| Termination Resistance, Dry Circuit | 3,7 | 2,5 | 2,5 | | 2,4 | | 2,4 | | | 3,7 |
| Dielectric Withstanding Voltage | | | | | | 2,6 | | 2,4 | 3,7 | |
| Insulation Resistance | | | | | | 3,7 | | | 2,6 | |
| Temperature Rise vs Current | | | | 3,9 | | | | | | |
| Vibration | 5 | | | 7 | | | | | | |
| Physical Shock | 6 | | | | | | | | | |
| Mating Force | 2 | | | | | | | | | 2 |
| Unmating Force | 8 | | | | | | | | | 6 |
| Contact Retention | | | | | 5 | | | | | |
| Durability | 4 | 3 | 3 | 4 | | | | | | 4 |
| Thermal Shock | | | | | | 4 | | | 4 | |
| Humidity-Temperature Cycling | | | 4 | 5 | | 5 | | | 5 | 5 |
| Industrial Mixed Flowing Gas | | | | | 3 | | | | | |
| Temperature Life | | 4 | | 6 | | | | | | |
| Fluid Immersion<br>Medical Splice Only | | | | | | | 3 | | | |
| Sealed Connector Only | | | | | | | | 3 | | |

(a) See Para 4.1.A
(b) Numbers indicate sequence in which tests are performed
(c) Group 8 consists of sealed connectors only
(d) Test groups 9 and 10 are for retention of qualification only

Figure 3

## 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. Test groups 1 thru 6 shall consist of 10 mated connectors for each style and wire size offered for inspection. Test groups 7 and 8 shall consist of 15 sealed connectors of each style. Test groups 9 and 10 shall consist 10 mated connectors of each style with randomly selected wire sizes.

| Style | Type | Wire Size for each Test Group | |
|---|---|---|---|
| | | 1 | 2 |
| Medical Splice | Pin | 26 | 26 |
| | Socket | 20 | 20 |
| 1/5 | Pin | 20 | 26 |
| | Socket | 20 | 26 |
| 5/15 | Pin | 20 | 20 |
| | Socket | 20 | 20 |
| 25/35 | Pin | 12 | 14 |
| | Socket | 12 | 14 |

Figure 4

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 3.

### 4.2. Requalification Testing

Requalification shall be established by the cognizant divisional engineering function and may consist of tests specified in Figure 3 provided that it is conducted within the required time period.

### 4.3. 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.

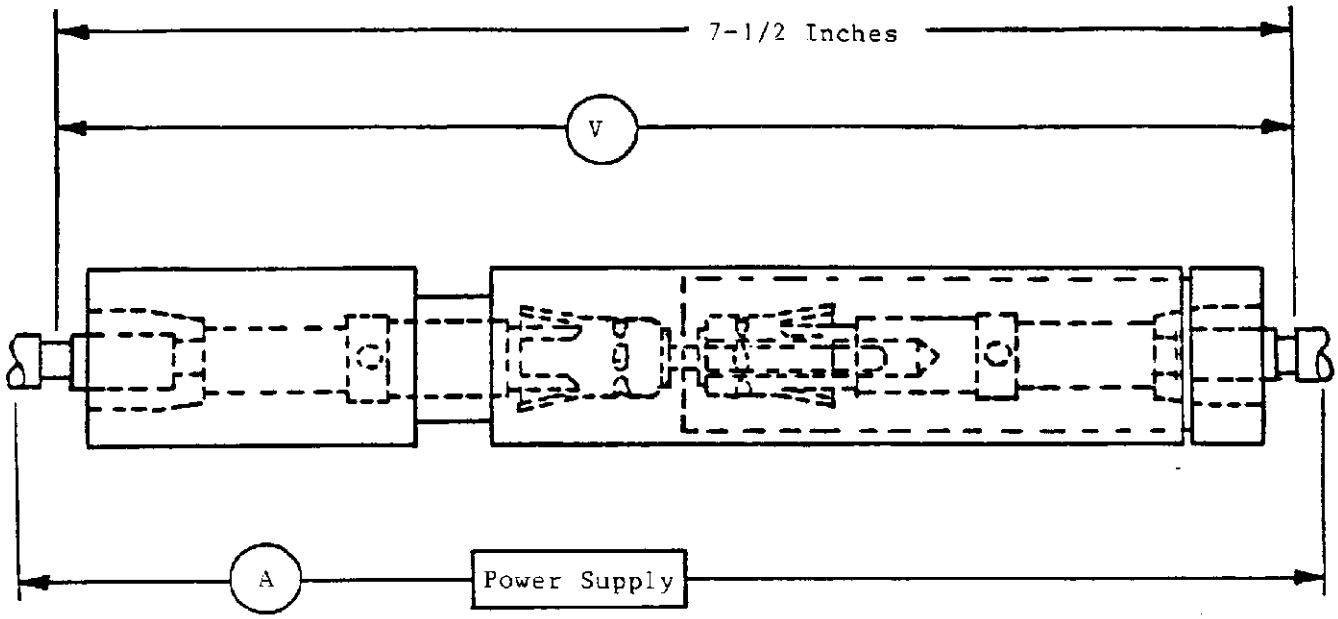


Figure 5
Contact Resistance