Miniature Circular Sealed Connector

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the AMP* miniature circular sealed electrical connectors. These connectors are designed for operation during the extremes of contamination, vibration and temperature common to automotive environments.

1.2. Classification

Connectors covered by this specification shall be of the following styles:

A. Style I: Free-Hanging
B. Style II: Panel-Mount

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 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. 114- : Applicable application specification for type contacts used

2.2. Commercial Standards

UL 514: Outlet Boxes and Fittings

3. REQUIREMENTS

3.1. Design and Construction

3.2. Materials

A. Contacts:
B. Housings:

3.3. Ratings

A. Current/Voltage: See applicable contact specification
B. Operating Temperature: -55° to 105°C

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	Meets requirements of product drawing and applicable AMP Application Specification.	Visual, dimensional and functional per applicable inspection plan.
	ELECTRICAL	
Dielectric Withstanding Voltage	1.2 kvac (rms) dielectric withstanding voltage, one minute hold.	Test between adjacent contacts of mated connector assemblies; AMP Spec 109-29-1.
Insulation Resistance	75 megohms minimum.	Test between adjacent contacts of mated connector assembly; AMP Spec 109-28-4.
	MECHANICAL	
Vibration	No discontinuities greater than 1 microsecond.	Subject mated connectors to 10 G's, 10-500 Hz with 100 ma current applied, see Figure 3; AMP Spec 109-21-2.
Physical Shock	No discontinuities greater than 1 microsecond.	Subject mated connector to 50 G's sawtooth in 11 milliseconds; 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
Maintenance Aging	No damage to connectors or locking mechanism on contacts.	Subject wired contacts in plug and receptacle to 5 insertions and extractions using proper tools; AMP Spec 109-17.
Contact Retention	10 pounds minimum without dislodging or damage. Contacts shall be removed and reinserted.	Apply axial load of 10 pounds to crimped contacts; AMP Spec 109-30 except grip wire.
Durability	No physical damage.	Mate and unmate plug and receptacle assemblies, by hand, for 50 cycles; AMP Spec 109-27.
	ENVIRONMENTAL	
Thermal Shock	No physical damage.	Subject mated connectors to 10 cycles between 55° and 105°C; AMP Spec 109-22.
Temperature Life	No physical damage.	Subject mated connectors to 105°C for 200 hours; AMP Spec 109-43, test level 6.
Raintightness (a)	75 megohms minimum insulation resistance.	Subject mated connectors to raintightness test, ends of connector wires shall remain outside of chamber; UL 514.
Fluid Immersion(a)	75 megohms minimum insulation resistance.	Subject mated connectors to one of the following fluids at ambient temperature, for 50 cycles each. One cycle shall consist of 5 seconds of immersion and 3 minutes of draining. Sample No 1 — Test Fluid: Gasoline Sample No 2 — Test Fluid: Diesel Fuel

Figure 1 (cont)

Test Description	Requirement	Procedure	
Fluid Immersion (a) (cont)		Sample No	Test Fluid
		3	Lubricating Oil (S. A. E. 30)
		4	Brake Fluid
		5	Anti-freeze temp shall be 120° ± 5°C.
		6	Automatic transmission temp shall be 50° ± 2°C.

(a) Measure between each contact and a conducting surface plus between adjacent contacts.

Figure 1 (end)

3.6. Connector Tests and Sequences

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Examination of Product	1, 9	1, 10	1, 7	1, 5
Dielectric Withstanding Voltage	3	3		
Insulation Resistance	2	2	2	2
Vibration			3	
Physical Shock			4	
Maintenance Aging	4			
Contact Retention	8	8	6	
Durability	6	9		
Thermal Shock		4		
Temperature Life		6		
Raintightness	5, 7	5, 7	5	4
Fluid Immersion				3

(a) See Para 4. 1. A.
(b) Numbers indicate sequence in which tests are performed.

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. Test groups 1, 2 and 3 shall consist of 2 connectors of each style. Test group 4 shall consist of 6 connectors of each style. One half of the samples in each group shall contain maximum gage wire and the other half minimum gage wire. Where contacts cover a range of wire sizes, one half of the samples shall be prepared with the largest size in the range, and the other half prepared with the smallest wire size in the range. All contacts shall be crimped to 6 feet of appropriate conductors in accordance with the applicable AMP Application Specification.

B. Test Sequence

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

C. Acceptance

(1) All samples tested in accordance with this specification shall meet the stated tolerance limit.

(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.

4.2. 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.

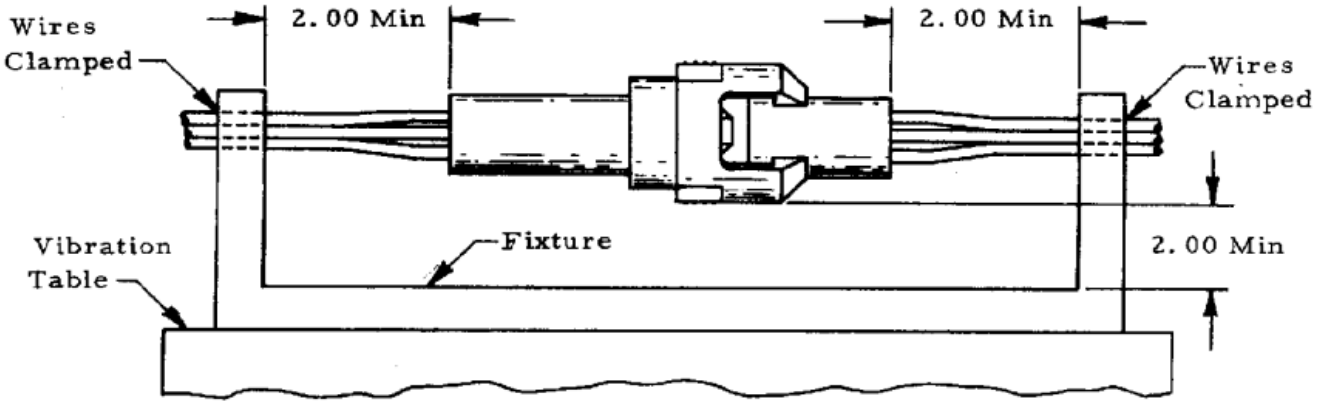

Figure 3