ECU 1 mm Round Contact System

1. INTRODUCTION

1.1. Purpose

Testing was performed on the AMP* ECU 1 mm contact system to determine its conformance to the requirements of AMP Product Specification 108-1805 Revision C.

1.2. Scope

This report covers the electrical and mechanical performance of the ECU 1 mm contact system. Testing was performed at the Americas Global Automotive Division Product Reliability Center between May98 and Oct98. The test file numbers for this testing are 19980232ACL and 19990102ACL. This documentation is on file at and available from the Americas Global Automotive Division Product Reliability Center.

1.3. Conclusion

The ECU 1 mm contact system listed in paragraph 1.5., conformed to the electrical and mechanical performance requirements of AMP Product Specification 108-1805 Revision C.

1.4. Test Samples

Test samples were representative of normal production lots. Samples identified with the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
1	30	776235-1	Generation II socket, 18 AWG wire
	30	776235-1	Generation II socket, 20 AWG wire
	60	770753-3	Male terminal
2	100	776235-1	Generation II socket
3	60	776235-1	Generation II socket, 18 AWG wire
	60	776235-1	Generation II socket, 20 AWG wire
4	30	776235-1	Generation II socket, 18 AWG wire
	30	776235-1	Generation II socket, 20 AWG wire
5	30	776235-1	Generation II socket, 18 AWG wire
	30	776235-1	Generation II socket, 20 AWG wire
6	30	776235-1	Generation II socket

Figure 1

1.5. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15 to 35°C
Relative Humidity: 20 to 80%

* Trademark
I Indicates change

LOC B

1.6. Qualification Test Sequence

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Examination of product	1,8	1,3	1,3	1,3	1,3	1,3
Termination resistance	3,6					
Temperature rise vs current	4,7					
Current cycling	5					
Durability	2					
Engaging/separating force		2				
Terminal bend, crimp			2			
Insulation crimp bend				2		
Crimp tensile, termination strength					2	
Sleeve retention						2

NOTE

(a) See paragraph 1.4.
(b) Numbers indicate sequence in which tests are performed.

Figure 2

2. SUMMARY OF TESTING

2.1. Examination of Product - All Test Groups

All samples submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by the Product Assurance Department. Where specified, samples were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. Termination Resistance - Test Group 1

All termination resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than 20 milliohms after testing.

2.3. Temperature Rise vs Current - Test Group 1

All samples had a temperature rise of less than 20°C above ambient when tested using a baseline rated current of 8.5 amperes for 20 AWG wire and 10.0 amperes for 18 AWG wire and the correct derating factor value based on the samples wiring configuration.

2.4. Current Cycling - Test Group 1

No evidence of physical damage was visible as a result of current cycling.

2.5. Durability - Test Group 1

No physical damage occurred to the samples as a result of manually mating and unmating the samples 10 times.

2.6. Engaging/Separating Force - Test Group 2

All engagement forces were less than 3.34 N [12.0 oz]. All separating forces were greater than .556 N [2.0 oz].

2.7. Terminal Bend, Crimp - Test Group 3

No samples exhibited fractures or bends greater than 30 degrees when a 9 N [2.02 lb] load was applied and held for 15 seconds at Location 1, or when a 22 N [5 lb] load was applied and held for 15 seconds at Location 2.

2.8. Insulation Crimp, Bend - Test Group 4

Insulation did not slip when subjected to a 10 N [2.25 lb] load at 5 random right angle pulls.

2.9. Crimp Tensile, Termination Strength - Test Group 5

No physical damage occurred to the terminals and no wires were pulled from the terminals as a result of applying an axial load of 115.68 N [26 lb] minimum for 18 AWG wire and 88.98 N [20 lb] minimum for 20 AWG wire to the wire.

2.10. Sleeve Retention - Test Group 6

No physical damage occurred to the sleeves and no sleeves moved as a result of applying an axial load at a rate of 25.4 mm [1 in] per minute.

3. TEST METHODS

3.1. Examination of Product

Where specified, samples were visually examined for evidence of physical damage detrimental to product performance.

3.2. Termination Resistance

Termination resistance measurements at low level current were made using a 4 terminal measuring technique (Figure 3). The test current was maintained at 100 milliamperes maximum with a 20 millivolt maximum open circuit voltage.

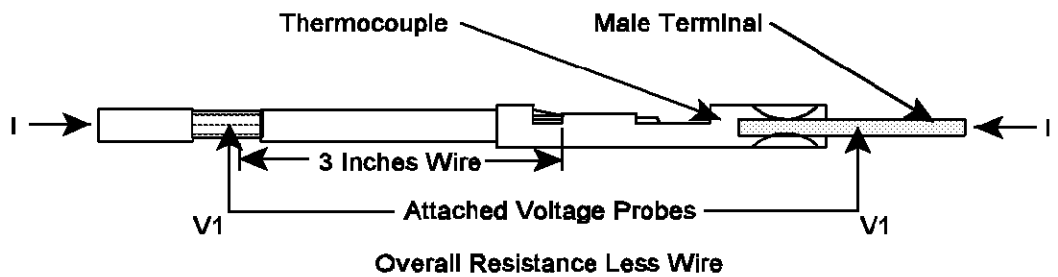

Figure 3
Typical Termination Resistance Measurement Points

3.3. Temperature Rise vs Current

Mated samples were arranged horizontally in an enclosure 50.8 mm [2 in] minimum from the bottom, 152.4 mm [6 in] minimum below the top, and 203.2 mm [8 in] minimum from the sides. Samples were energized and allowed to maintain thermal stability. Once thermal stability was achieved, 3 consecutive readings were taken at 5 minute intervals. These readings could vary no more than 1°C. Once the samples were stable at that temperature level, the current was increased to the next level. This cycle was repeated until a 20°C temperature rise was achieved.

3.4. Current Cycling

Samples terminated to 20 AWG wire were cycled at 8.5 amperes. Samples terminated to 18 AWG wire were cycled at 10 amperes. Current was applied for 45 minutes ON and 15 minutes OFF. This cycle was repeated 1007 times. Voltage drop and temperature rise measurements were recorded once a week 30 minutes into the ON cycle.

3.5. Durability

Terminals were manually mated 5 mm [0.197 in] into the socket and then unmated. This cycle was repeated 10 times.

3.6. Engaging/Separating Force

Testing was performed by cycling contact pins in and out of the receptacles at a maximum rate of 25.4 mm [1 in] per minute.

3.7. Terminal Bend, Crimp

Samples were held in a pin vise at specified locations while a 9 N [2.02 lb] load was applied for 15 seconds at Location 1, and a 22 N [5 lb] load was applied for 15 seconds at Location 2.

3.8. Insulation Crimp, Bend

Samples were held in a pin vise at specified locations while a 10 N [2.25 lb] load was applied at 5 random right angles for 15 seconds.

3.9. Crimp Tensile, Termination Strength

Testing was performed by holding samples in a vise and applying an axial load at a maximum rate of 50.8 mm [2 in] per minute.

3.10. Sleeve Retention

Testing was performed by holding samples in a pull test fixture and applying an axial load at a maximum rate of 25.4 mm [1 in] per minute.