NETCONNECT* Toolless Jacks

1. INTRODUCTION

1.1. Purpose

Testing was performed on NETCONNECT* toolless jacks to determine their conformance to the requirements of Product Specification 108-1916 Revision B.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of NETCONNECT toolless jacks. Testing was performed at the Americas Global Automotive Division Product Reliability Center between Mar99 and Feb00. The test file number for this testing is 1990309ACL. This documentation is on file at and available from the Americas Global Automotive Division Product Reliability Center. Additional testing using specimens prepared with 24 AWG stranded conductors was performed at the Engineering Assurance Product Test Laboratory between 16Aug01 and 21Aug01. The test file number for this testing is CLT 2965-002A. This documentation is on file at and available from the Engineering Assurance Product Test Laboratory.

1.3. Conclusion

The NETCONNECT toolless jacks listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-1916 Revision B.

1.4. Product Description

NETCONNECT toolless jacks are designed for installation into various face plates, surface mount boxes, panels, and other similar type fittings. They incorporate IDC terminals for terminating both shielded and unshielded twisted pair communications cable. Toolless jacks will accommodate 22 to 24 AWG solid conductors and 24 AWG stranded conductors. The maximum conductor insulation diameter is 1.14 mm [0.045 in].

1.5. Test Specimens

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

Test Group	Quantity	Part Number	Description
1,2,3,4,5,6,7	5 each	1116604-2	Toolless mod jack
7	5	1116604-9	8 position jack
7	5	406483-3	8 position plug assembly

Figure 1

1.6. Environmental Conditions

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

- Temperature: 15 to 35°C
- Relative Humidity: 25 to 75%

* Trademark
I Indicates change

LOC B

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Examination of product	1,9	1,5	1,5	1,7	1,7	1,3	1,5
Termination resistance, overall	3,7	2,4	2,4		2,6		2,4
Insulation resistance				2,6			
Dielectric withstanding voltage				3,			
Vibration	5						
Mechanical shock	6						
Durability, jack interface	4				3(c)		
Durability, jack IDC							3
Mating force	2						
Unmating force	8						
Plug retention in jack						2	
Thermal shock				4	4		
Humidity-temperature cycling				5	5		
Temperature life		3(d)					
Mixed flowing gas			3(d)				

NOTE

(a) See paragraph 1.5.
(b) Numbers indicate sequence in which tests are performed.
(c) Perform 100 cycles on jack interface before thermal shock, 33 cycles after 50 cycles of thermal shock, 33 cycles after 7 days of humidity-temperature cycling, and 34 cycles after 21 days of humidity-temperature cycling.
(d) Precondition jack interface with 10 cycles durability.

Figure 2

2. SUMMARY OF TESTING

2.1. Examination of Product - All Test Groups

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

2.2. Termination Resistance - Test Groups 1, 2, 3, 5 and 7

All termination resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage had a change in resistance (ΔR) of less than 20 milliohms.

2.3. Insulation Resistance - Test Group 4

All insulation resistance measurements were greater than 100 megohms.

2.4. Dielectric Withstanding Voltage - Test Group 4

No dielectric breakdown or flashover occurred.

2.5. Vibration - Test Group 1

No discontinuities were detected during vibration testing. Following vibration testing, no cracks, breaks, or loose parts on the specimens were visible.

2.6. Mechanical Shock - Test Group 1

No discontinuities were detected during mechanical shock testing. Following mechanical shock testing, no cracks, breaks, or loose parts on the specimens were visible.

2.7. Durability, Jack Interface - Test Groups 1 and 5

No physical damage occurred as a result of mating and unmating the specimens 750 times.

2.8. Durability, Jack IDC - Test Group 7

No physical damage occurred as a result of terminating and reterminating the IDC contact 30 times.

2.9. Mating Force - Test Group 1

All mating force measurements were less than 10 pounds.

2.10. Unmating Force - Test Group 1

All unmating force measurements were less than 5 pounds.

2.11. Plug Retention In Jack - Test Group 6

Plugs did not dislodge from the jacks under an axial load of 20 pounds.

2.12. Thermal Shock - Test Groups 4 and 5

No evidence of physical damage was visible as a result of thermal shock testing.

2.13. Humidity-temperature Cycling - Test Groups 4 and 5

No evidence of physical damage was visible as a result of humidity-temperature cycling.

2.14. Temperature Life - Test Group 2

No evidence of physical damage was visible as a result of temperature life testing.

2.15. Mixed Flowing Gas - Test Group 3

No evidence of physical damage was visible as a result of exposure to the pollutants of mixed flowing gas.

3. TEST METHODS

3.1. Initial Examination of Product

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

3.2. Termination Resistance

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

3.3. Insulation Resistance

Insulation resistance was measured between adjacent contacts of mated specimens. A test voltage of 500 volts DC was applied for 1 minute before the resistance was measured.

3.4. Dielectric Withstanding Voltage

A test potential of 1000 volts AC was applied between the adjacent contacts of mated specimens. This potential was applied for 1 minute and then returned to zero.

3.5. Vibration, Random

Mated specimens were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 1.5 mm [0.06 in], double amplitude. The vibration frequency was varied uniformly between the limits of 10 and 55 Hz and returned to 10 Hz in 1 minute. This cycle was performed 120 times in each of 3 mutually perpendicular planes for a total vibration time of 5.25 hours. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.6. Mechanical Shock, Half-sine

Mated specimens were subjected to a mechanical shock test having a half-sine waveform of 50 gravity units (g peak) and a duration of 11 milliseconds. Three shocks in each direction were applied along the 3 mutually perpendicular planes for a total of 18 shocks. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.7. Durability, Jack Interface

Specimens were manually mated and unmated 750 times at a maximum rate of 600 cycles per hour.

3.8. Durability, Jack IDC

Specimens were terminated and reterminated 30 times.

3.9. Mating Force

The force required to mate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of .5 inch per minute. The maximum average force per contact was calculated.

3.10. Unmating Force

The force required to unmate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of .5 inch per minute. The minimum average force per contact was calculated.

3.11. Plug Retention In Jack

An axial load of 20 pounds was applied to mated specimens in a manner which would cause the specimens locking latches to disengage.

3.12. Thermal Shock

Mated specimens were subjected to 100 cycles of thermal shock with each cycle consisting of 30 minute dwells at -40 and 70°C. The transition between temperatures was less than 1 minute.

3.13. Humidity-temperature Cycling

Mated specimens were exposed to 21 cycles of humidity-temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25°C and 65°C twice while maintaining high humidity. During 5 of the first 9 cycles, the specimens were exposed to a cold shock of -10°C for 3 hours.

3.14. Temperature Life

Mated specimens were exposed to a temperature of 70°C for 500 hours. Specimens were preconditioned with 10 cycles of durability.

3.15. Mixed Flowing Gas, Class IIA

Mated specimens were exposed for 14 days to a mixed flowing gas Class IIA exposure. Class IIA exposure is defined as a temperature of 30°C and a relative humidity of 70% with the pollutants of Cl_2 at 10 ppb, NO_2 at 200 ppb, H_2S at 10 ppb and SO_2 at 100 ppb. Specimens were preconditioned with 10 cycles of durability.