AMP*

QUALIFICATION TEST REPORT

CONNECTOR, BURNER, HEAVY DUTY,
TWO CIRCUIT

501-165 Rev. 0

Product Specification:	108-1056 Rev. 0
CTL No.:	CTL1353-103-003
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Classification:	Unrestricted
Prepared By:	Terrance M. Shingara

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Corporate Test Laboratory Harrisburg, Pennsylvania

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(R1353TS)

AMP

AMP INCORPORATED

HARRISBURG, PENNSYLVANIA 17105 PHONE: 717-564-0100 TWX: 510-657-4110

CORPORATE TEST LABORATORY

Qualification Test Report
Two Circuit, Heavy Duty
Burner Connector

1. Introduction

1.1 Purpose

Testing was performed on AMP's Two Circuit, Heavy Duty Burner Connector to determine its conformance to the requirements of AMP Product Specification 108-1056 Rev.0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Two Circuit, Heavy Duty Burner Connector Connector manufactured by the Support Services Business Unit of the Automotive/Consumer Business Group. The testing was performed between August 16,1991 and January 31,1992.

1.3 Conclusion

The Two Circuit heavy Duty Burner Connector meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1056 Rev. 0.

1.4 Product Description

The Two Circuit, Heavy Duty, Burner Connector provides a reliable means of connect/disconnect for range surface burner units. The contacts are a high temperature copper alloy. The housing material are either black Phenolic, heat resistant grade, UL 94V-0 or Porcelain, L-3 steatite, natural.

1.5 Test Samples

The test samples were randomly selected from normal current production lots, and the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
1,2,3,4	140	640748-1	Terminal
	70	770524-1	Housing
	70	640751-1	Clip
1	10	103836-3	Test tab
2,3,4	60	[1] MP26YA	8" Burner

[1] 8" CHROMALOX, 208/240V 1955/2600 watts

1.6 Qualification Test Sequence

Test or Examination	Test Groups 1	2	3	4
Examination of Product	1	1,9	1,8	1,5
Termination Resistance, Dry Circuit	4,8	2,7		
Dielectric Withstanding Voltage			3,7	
Insulation Resistance			2,6	
T-Rise vs. Current		3,8		2,4
Current Cycling				3
Vibration	6	6		
Physical Shock	7			
Mating Force	3			
Unmating Force	9			
Contact Insertion Force	2			
Contact Retention	10			
Crimp Tensile	11			
Durability	5			
Thermal Shock			4	
Humidity-Temperature Cycling		4	5	
Temperature Life		5		

The numbers indicate sequence in which tests were performed.

2. Summary of Testing

2.1 Examination of Product - All Groups

All samples submitted for testing were selected from normal current production lots. They were inspected and accepted by the Product Assurance Department of the Automotive/Consumer Business Group.

2.2 Termination Resistance, Dry Circuit - Group 1,2

All termination resistance measurements, taken at 100 milliamperes dc. and 50 millivolts open circuit voltage, had less than 5.0 milliohms change in resistance (ΔR).

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	9	After Mechanical	0.195	3.495	1.396
2	20	After Current Ver.	0.000	3.990	2.299

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 3

No dielectric breakdown or flashover occurred when a test voltage was applied between adjacent contacts.

2.4 Insulation Resistance - Group 3

All insulation resistance measurements were greater than 5000 megohms.

2.5 Temperature Rise vs. Current - Groups 2,4

All samples had a temperature rise of less than 30°C above ambient when a specified current of 9 amperes (AC RMS) was applied.

2.6 Current Cycling - Group 4

No evidence of physical damage was visible to the test samples, after 3500 cycles of cycling the current on and off at a current of 12.5 amperes.

2.7 Vibration - Groups 1,2

Following vibration, no cracks, breaks, or loose parts on the connector assemblies were visible.

2.8 Physical Shock - Group 1

Following physical shock testing, no cracks, breaks, or loose parts on the connector assemblies were visible.

2.9 Mating Force - Group 1

All mating force measurements were less than 12 pounds.

2.10 Unmating Force - Group 1

All unmating force measurements were greater than 1.5 pounds.

2.11 Contact Insertion Force - Group 1

The force required to insert each contact into its housing cavity was less than 6.0 pounds.

2.12 Contact Retention - Group 1

No physical damage occurred to either the contacts or the housing, and no contacts dislodged from the housings as a result of applying an axial load of 25 pounds to the contacts.

2.13 Crimp Tensile - Group 1

All tensile values were greater than 30 pounds for samples on 18AWG wire and 45 pounds for 16AWG wire.

2.14 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 3500 times.

2.5 Thermal Shock - Group 3

No evidence of physical damage to either the contacts or the connector was visible as a result of thermal shock.

2.6 Humidity-Temperature Cycling - Groups 2,3

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to humidity-temperature cycling.

2.7 Temperature Life - Group 2

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to an elevated temperature.

3. Test Methods

3.1 Examination of Product

Product drawings and inspection plans were used to examine the samples. They were examined visually and functionally.

3.2 Termination Resistance, Low Level

Termination resistance measurements at low level current were made, using a four terminal measuring technique (Figure 1). The test current was maintained at 100 milliamperes dc, with an open circuit voltage of 50 millivolts dc.

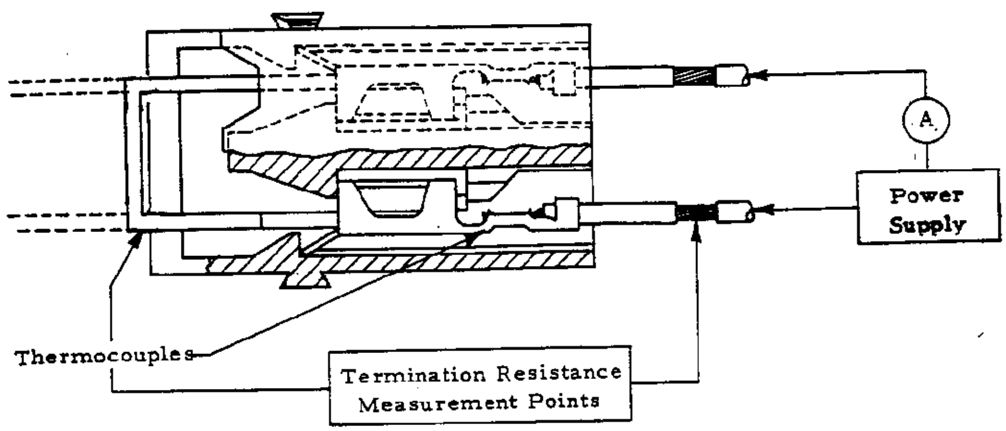

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1600 vac was applied between the adjacent contacts. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation resistance was measured between adjacent contacts, using a test voltage of 500 vdc. This voltage was applied for one minutes before the resistance was measured.

3.5 Temperature Rise vs Specified Current

Connector temperature was measured, while energized at the specified current of 9.0 amperes ac. Thermocouples were attached to the connectors to measure their temperatures. This temperature was then subtracted from the ambient temperature to find the temperature rise. When three readings at five minute intervals were the same, the readings were recorded.

3.6 Current Cycling

The connectors were cycled on and off at 12.5 amperes ac. Testing consisted of 3500 cycles, with each cycle having current on for 15 minutes and current off for 15 minutes.

3.7 Vibration, Random

Mated connectors were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 5 and 500 hertz. The power spectral density at 5 hz is 0.000625 G^2/Hz. The spectrum slopes up at 12 dB per octave to a PSD of 0.01 G^2/Hz at 10 Hz. The spectrum is flat at 0.01 G^2/Hz from 10 to upper bound frequency of 500 Hz. The root-mean square amplitude of the excitation was 2.217 GRMS.

3.8 Physical Shock

Mated connectors were subjected to a physical shock test, having a half-sine waveform of 50 gravity units (g peak) and a duration of 1 milliseconds. Three shocks in each direction were applied along the three mutually perpendicular planes, for a total of 18 shocks.

3.9 Mating Force

The force required to mate the connector assembly with a burner unit was measured, using a free floating fixture with the rate of travel at 0.25 inch/minute.

3.10 Unmating Force

The force required to unmate the connector assembly with a burner unit was measured, using a free floating fixture with the rate of travel at 0.25 inch/minute.

3.11 Contact Insertion Force

The force required to insert each contact into the housing was measured.

3.12 Contact Retention

An axial load of 25 pounds was applied to each contact and held for 60 seconds. The force was applied in a direction to cause removal of the contacts from the housing.

3.13 Crimp Tensile

An axial load was applied to each sample at a crosshead rate of 1.0 inch per minute.

3.14 Durability

Connectors were mated and unmated 3500 times at a rate not exceeding 600 per hour.

3.15 Thermal Shock

Mated connectors were subjected to 25 cycles of temperature extremes, with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -40°C and 200°C. The transition between temperatures was less than one minute.

3.16 Humidity-Temperature Cycling

Mated connectors were exposed to 10 cycles of humidity-temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25°C and 65°C twice, while the relative humidity was held at 95%.

3.17 Temperature Life

Mated samples were exposed to a temperature of 200°C for 500 hours.

4. Validation

Prepared by:

2/18/92
Terrance M. Shingara
Test Engineer
Design Assurance Testing
Corporate Test Laboratory

Reviewed by:

2/20/92
Richard A. Groft
Supervisor
Design Assurance Testing
Corporate Test Laboratory

Approved by:

2/27/92
William Zelner
Manager
Product Assurance
Automotive/Consumer Business Group (North)