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040III SERIES MULTI-LOCK CONNECTOR  
for Wire to Wire Termination

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**1. Scope :**

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of 040III Series Multi-lock Connector for Wire Termination. Applicable product description and part numbers are as shown in Appendix 1.

**2. Applicable Document :**

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 Specification

- A. 109-5000 : Test Specification, General Requirements for Test Methods
- B. 114-5217 : Application Specification Crimping .040III Series Unsealed Receptacle Contact.
- C. 114-5228 : Application Specification Crimping .040III Series Unsealed Tab Contact.
- D. 501-5293 : Test Report

2.2 Commercial Standards and Specifications:

- A. JASO D605 : Electric Connector for Automobiles
- B. JASO D611 : Low-tension Cables with Thin Wall Insulation for Automobiles
- C. JIS C3406 : Low-Voltage Wires and Cables for Automobiles
- D. JIS D0203 : Method of Moisture, Rain and Spray Test for Automobile Parts
- E. JIS D0204 : Method of High and Low Temperature Test for Automobile Parts
- F. JIS D1601 : Vibration Testing Method for Automobile Parts
- G. JIS R5210 : Portland Cement

### 3. Requirements:

#### 3.1 Design and Construction :

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing

#### 3.2 Material

##### A. Contact :

###### a. Receptacle Contact

: Pre-tinned Cu Alloy and Gold plating Cu alloy over Ni under plating

###### b. Tab Contact

: Pre-tinned brass and Gold plating brass over Ni under plating

##### B. Housing : PBT resin

#### 3.3 Ratings

##### A. Temperature Rating : $-40^{\circ}\text{C}$ to $105^{\circ}\text{C}$ (Ambient temperature + temperature rise due to energized current)

#### 3.4 Performance Requirements and Test Descriptions :

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.1. All tests shall be performed in the room temperature, unless otherwise specified.

3.5 Test Requirements and Procedures Summary :

Para.	Test Items	Requirements	Procedures
3.5.1	Confirmation of Product	Product shall be conforming to the requirements of applicable product drawing and Application Specification.	Visually ,dimensionally and functionally inspected per applicable quality inspection plan.
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	10mΩ Max. (Initial) 20mΩ Max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10mA Max. at open circuit voltage of 20mV Max. Fig. 3 AMP Spec. 109-5311-1
3.5.3	Dielectric Strength	No creeping discharge or flashover shall occur.	1kVAC for 1 minute. Test between adjacent circuit of mated connectors. Fig. 4 AMP Spec. 109-5301
3.5.4	Insulation Resistance	100MΩ Min. (Initial, Final)	Impressed voltage 500VDC Test between adjacent circuits of mated connector. Fig. 4 AMP Spec. 109-5302
3.5.5	Current Leakage	1mA Max. (Initial, Final)	12V DC impressed 1 min. Fig. 5 AMP Spec. 109-5312
3.5.6	Temperature Rising	25°C Max. under loaded specified current	Measure temperature rising by energized current, 3A Current applied to every other positions AMP Spec. 109-5310
3.5.7	Current Cycling	20mΩ Max. (Final) No ignition is allowed during the test	Applied Current : 3A Current applied to every other positions. 45minutes "ON" ,15minutes " OFF" 200cycles AMP Spec. 109-5308
Physical Requirements			
3.5.8	Vibration (High Frequency)	No electrical discontinuity greater than 1μ sec. shall occur. 20mΩ Max. (Final)	Vibration Frequency : 20~200~20Hz/3min. Accelerated Velocity : 44. 1m/s <sup>2</sup> (4. 5G) Fig. 7 Vibration Direction and Vibration Duration : Up and Down—4hours Back and Force—2hours Right and Left—2hours

Fig.1 (To be continued)

Para.	Test Items	Requirements		Procedures	
3.5.9	Connector Mating Force	16Pos. : 70N Max. 20~24Pos. : 78N Max.		Operation Speed : 100mm/min. Measure the force required to mate connectors. AMP Spec. 109-5206	
3.5.10	Connector Unmating Force			Operation Speed : 100mm / min. Measure the force required to unmate connectors. AMP Spec. 109-5206	
3.5.11	Connector Locking Strength	98N Min.		Operation Speed : 100mm/min. Measure housing locking strength. AMP Spec. 109-5210	
3.5.12	Contact Insertion Force	9.8N Max. (Per one piece of contact)		Operation Speed : 100mm/min. Measure the force required to insert contact into housing. AMP Spec. 109-5211	
3.5.13	Contact Retention Force	Primary lock : 39.2N Min. W/TPA : 98N Min.		Operation Speed : 100mm/min. Measure the contact retention force required. AMP Spec. 109-5212	
3.5.14	Crimp Tensile Strength	Wire Size		Operation Speed : 100mm/min. Apply an axial pull-off load to crimped Wire of contact secured on the tester. AMP Spec. 109-5205	
		mm <sup>2</sup>	(AWG)		Crimp Tensile Strength (Min.)
		0.3	22		N
		0.5	20		58 88
3.5.15	Durability (Repeated Mate/Unmating)	20mΩ Max. (Final)		Operation Speed : 100mm/min. No. of Cycles : 30 Cycles AMP Spec. 109-5213	
3.5.16	Resistance to "Kojiri"	20mΩ Max. (Final)		Mated/Pre-mated connector Direction : Back/Force, Right/Left No. of Cycles : 5 Cycles Fig. 6 AMP Spec. 109-5215	
3.5.17	Handling Ergonomics	No abnormalities allowed in manual mating/unmating handling.		Manually operated	

Fig.1 (To be continued)

Para.	Test Items	Requirements	Procedures
Environmental Requirements			
3. 5. 18	Thermal Shock	20mΩ Max. (Final)	Mated Connector -30°C/60min., 80°C/60min. Making this a cycle, repeat 5 cycles. Fig. 8 AMP Spec. 109-5103
3. 5. 19	Humidity, Steady State	Insulation resistance (Final) 100MΩ Min. Termination resistance	Mated connector, 90~95%R. H., 60°C 96hours AMP Spec. 109-5105
3. 5. 20	Industrial Gas (SO <sub>2</sub> )	20mΩ Min. (Final)	SO <sub>2</sub> Gas : 10ppm, 95% R.H. 20°C, 24hours AMP Spec. 109-5107
3. 5. 21	Temperature Life (Heat Aging)	20mΩ Max. (Final)	120°C, Duration : 120hours AMP Spec. 109-5104
3. 5. 22	Resistance to Cold	20mΩ Max. (Final)	-50°C±5°C, 120hours AMP Spec. 109-5108
3. 5. 23	Dust Bombardment	20mΩ Max. (Final)	Subject JIS R 5210 cement blow of 1.5kg per 10 seconds in 15 minutes intervals for 60minutes. AMP Spec. 109-5110

Fig. 1 (End)

3.6 Product Qualification Test Sequence

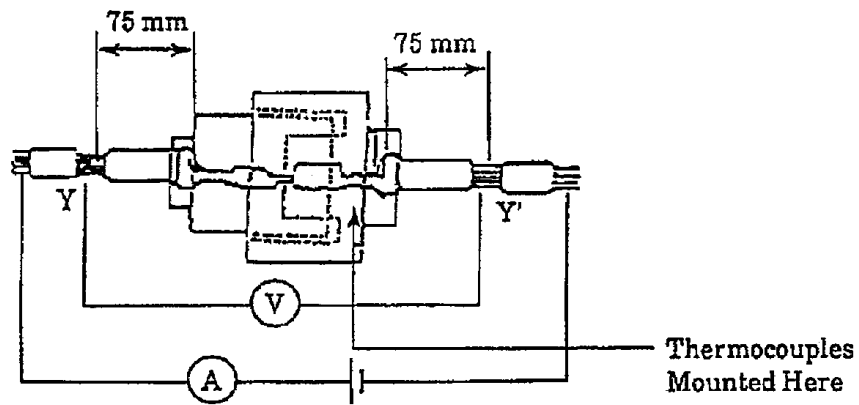
Para.	Test Items	Test Group									
		1	2	3	4	5	6	7	8	9	10
		Test Sequence (a)									
3.5.1	Confirmation of Product	1	1	1	1	1, 7	1, 7	1, 7	1, 9	1, 14	1
3.5.2	Termination Resistance (Low level)			3		2, 4, 6	2, 4, 6	2, 4, 6	2, 4, 6, 8	2, 5, 8, 12	
3.5.3	Dielectric Strength				3					10	
3.5.4	Insulation Resistance				2					9	
3.5.5	Current Leakage				4					3, 7	
3.5.6	Temperature Rise		2								
3.5.7	Current Cycling								7		
3.5.8	Vibration (High frequency)								5		
3.5.9	Connector Mating Force			2							
3.5.10	Connector Unmating Force			4							
3.5.11	Housing Locking Strength		3								
3.5.12	Connector Insertion Force										2
3.5.13	Connector Retention Force										3
3.5.14	Crimp Tensile Strength	2									
3.5.15	Durability (Repeated Mate/Unmating)									4	
3.5.16	Resistance to "Kojiri"							3	3		
3.5.17	Handling Ergonomics					7				13	
3.5.18	Thermal Shock					3					
3.5.19	Humidity (steady state)					5				6	
3.5.20	Industrial Gas (SO <sub>2</sub> )									11	
3.5.21	Temperature Life (Heat Aging)						3				
3.5.22	Resistance to Cold						5				
3.5.23	Dust Bombardment							5			

Fig. 2

(a) Numbers indicate sequence in which tests are performed.

Number of Specimens : Each sample group used for the specified performance tests,

Shall consists of not less than 20 sets of contacts and not less than 3 sets of connector assemblies.



From the measured readings, deduct the resistance of the 150mm long wire used for termination.  
 For obtaining uniformity of the current density on probing points Y-Y' , apply soldering on the probing points prior testing.

Fig. 3 Measurement of Termination Resistance

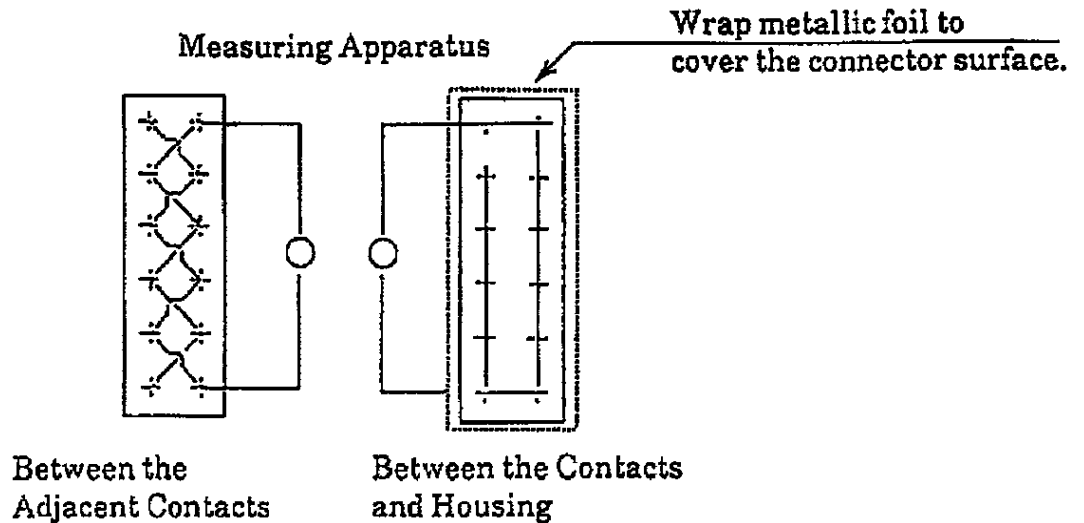


Fig. 4

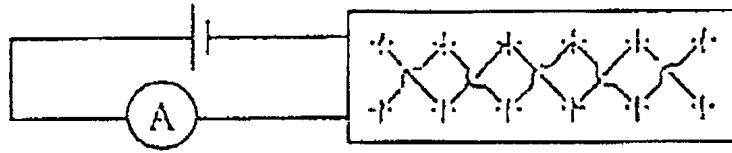


Fig. 5

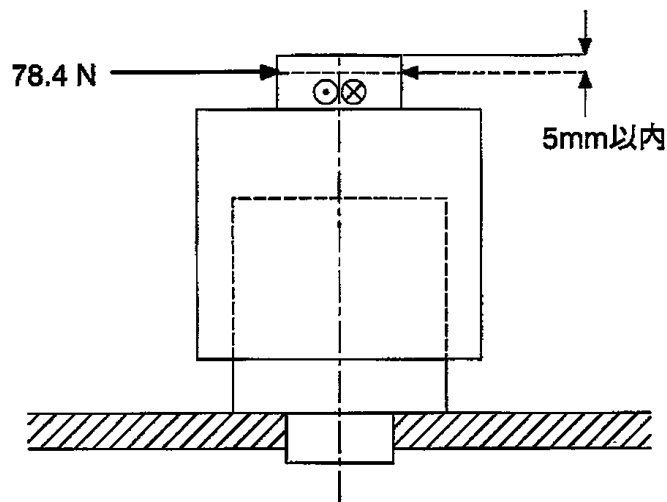


Fig. 6



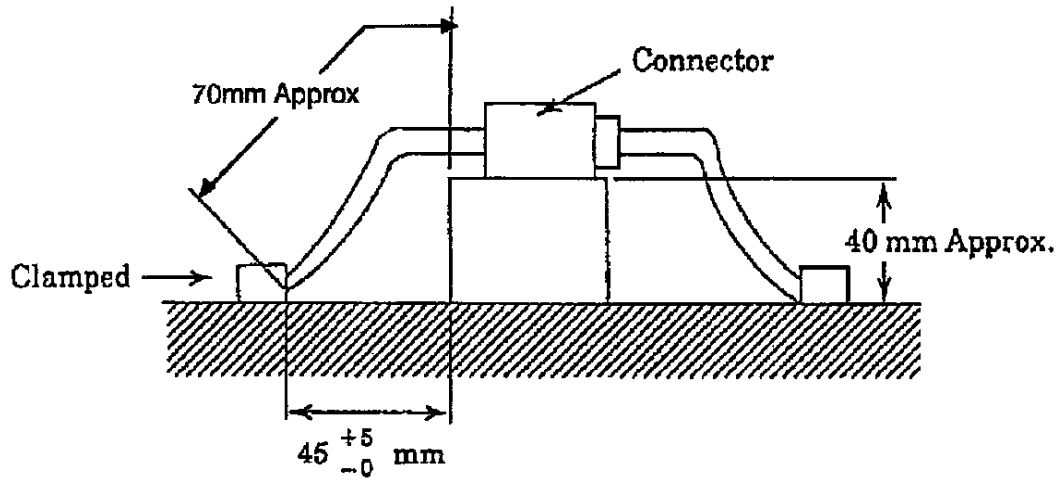


Fig. 7

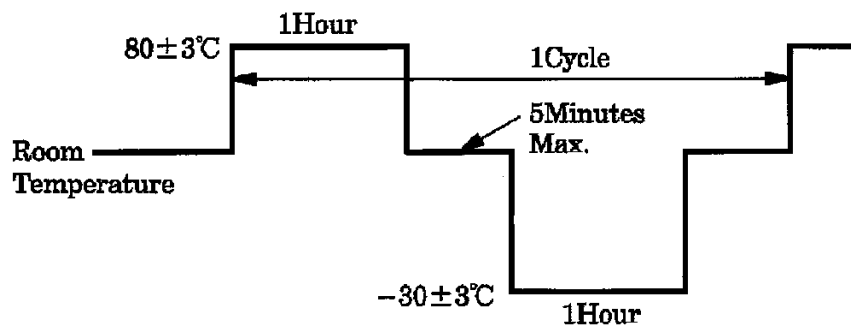


Fig. 8

The applicable product descriptions and part number (examples) are as shown in Appendix 1

Appendix 1

Product Part Number	Description
1123371, 1123375, 1123377	040III Unsealed Connector 16Position Plug Housing Assembly
1123379, 1123383, 1123385	040III Unsealed Connector 20Position Plug Housing Assembly
1123387, 1123391, 1123393	040III Unsealed Connector 24Position Plug Housing Assembly
1123350, 1123353, 1123355	040III Unsealed Connector 16Position Cap Housing Assembly
1123357, 1123360, 1123362	040III Unsealed Connector 20Position Cap Housing Assembly
1123364, 1123367, 1123369	040III Unsealed Connector 24Position Cap Housing Assembly
316836-1	040III Unsealed Receptacle Contact (Pre-Tin)
316837-2	040III Unsealed Receptacle Contact (Au)
353537-1	040III Unsealed Tab Contact (Pre-Tin)
353537-2	040III Unsealed Tab Contact (Au)