

Product Name 060/187 PLUG ASSEMBLY

1. Scope

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of 060/187 plug assembly .

Applicable product description and part numbers are as shown in Appendix 1.

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.109-5000 Test Specification,
General Requirements for Test Methods
- B.114-5126,114-5216
Application Specification
- C.501-5347 Test Report:
- D.411-5967 , 411-5982-1 , 411-78144
Instruction Sheet

2.2 Commercial Standards and Specifications:

- A.JASO D605 Multi-pole Connector for Automobiles
- B.JASO D7101 Test Methods for Plastic Molded Parts
- C.JIS C3406 Low Voltage Wire and Cables for Automobiles
- D.JIS D0203 Method of Moisture Rain on Spray 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 Materials:**A.Contact :**

- a. 060 Receptacle Contact : Cu Alloy(Pri-Tin)
- b. .187 Receptacle Contact : Brass(Pri-Tin)
- c. Tab Contact : Brass(Pri-Tin)

B.Housing :

- a.PBT resin

C.Other :

- a.Seal Ring : Silicon Rubber
- b..060 Rubber Plug : Silicon Rubber
- c..060 Cavity Plug : Silicon Rubber

3.3 Ratings :

- A. Temperature Rating : -30°C to 105°C

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	Examination of Product	Meets requirements of product drawing and AMP Specification 114-5126 , 114-5216.	Visual inspection No physical damage.
3.5.2	Handling Ergonomics	No abnormalities allowed in manual mating/unmating handling.	Manually operated
Electrical Requirements			
3.5.3	Termination Resistance (Low Level)	060 Receptacle Contact 5m Ω Max.(Initial) Or 10m Ω Max.(Final) ----- 187 Receptacle Contact 3m Ω Max.(Initial) Or 10m Ω Max.(Final)	Subject mated contacts assembled in housing to 20 \pm 1mV Max. open circuit at 10 \pm 0.5mA. Max. Fig. 2. AMP Spec. 109-5311-1
3.5.4	Termination Resistance (Specified Current)	060 Receptacle Contact 5m Ω Max.(Initial) Or 10m Ω Max.(Final) ----- 187 Receptacle Contact 3m Ω Max.(Initial) Or 10m Ω Max.(Final)	Subject mated contacts assembled in housing to 12V Max. open circuit at 1A. Max. Fig. 2. AMP Spec. 109-5311-2
3.5.5	Insulation Resistance	100M Ω Min. (Final)	Impressed voltage 500 V DC. Test between adjacent circuits of mated connectors. Fig.3. AMP Spec. 109-5302
3.5.6	Dielectric withstanding Voltage	No creeping discharge nor flashover shall occur.	1KvaC for 1 minute. Test between adjacent circuits of mated connectors. Fig.3. AMP Spec. 109-5301
3.5.7	Current Leakage	3mA Max.	12V DC impressed 60min. Fig.4
3.5.8	Current Cycling	10m Ω Max.(Final) No ignition is allowed during the test. No abnormalities in visual inspection. No physical damage allowed, and shall meet the requirements of subsequent testing.	Applied Current : Fig.5. 45 minutes "ON", 15 Minutes "OFF" 300 cycles. AMP Spec. 109-5308

Fig. 1 (CONT.)

Para	Test Items	Requirements	Procedures																								
3.5.9	Temperature Rising	60°C Max. under loaded specified current or rating current.	Measure temperature rising by energized current. Fig.5. AMP Spec. 109-5310 Method																								
Mechanical Requirements																											
3.5.10	Contact Retention Force	060 Receptacle Contact Lance Only : 39.2N Min. With Secondary Lock : 98N Min. ----- 187 Receptacle Contact Lance Only : 78 N Min. With Secondary Lock : 98N Min.	Apply an axial pull-off load to crimped wire. Operation Speed: 100 mm/min.																								
3.5.11	Connector Locking Strength	98 N Min.	Measure connector locking strength. Operation Speed : 100 mm/min.																								
3.5.12	Contact Insertion Force	060 Receptacle Contact 14.7 N Max. per contact ----- 187 Receptacle Contact 29.4 N Max. per contact	Measure the force required to insert contact into housing.																								
3.5.13	Connector Mating Force	25Pos.: 127.4N Max. ----- 47Pos.: 68.6N Max. ----- 26Pos.: 68.6N Max ----- 26Pos(Slide-Type): 127.4N Max	Operation Speed : 100mm/min. Measure the force required to mate connector. AMP Spec. 109-5206 Condition																								
3.5.14	Connector Unmating Force	25Pos.: 127.4N Max. ----- 47Pos.: 68.6N Max. ----- 26Pos.: 68.6N Max ----- 26Pos.(Slide-Type): 127.4N Max	Operation Speed : 100mm/min. Measure the force required to unmate connector. AMP Spec. 109-5206 Condition																								
3.5.16	Crimp Tensile Strength	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Wire Size</th> <th>Crimp Tensile(min)</th> </tr> <tr> <th>mm²</th> <th>(AWG)</th> <th>N</th> </tr> </thead> <tbody> <tr> <td>0.3</td> <td>22</td> <td>49</td> </tr> <tr> <td>0.5</td> <td>20</td> <td>88.2</td> </tr> <tr> <td>0.85</td> <td>18</td> <td>127.5</td> </tr> <tr> <td>1.25</td> <td>16</td> <td>176.5</td> </tr> <tr> <td>2</td> <td>14</td> <td>245.2</td> </tr> <tr> <td>3</td> <td>12</td> <td>294.2</td> </tr> </tbody> </table>	Wire Size		Crimp Tensile(min)	mm ²	(AWG)	N	0.3	22	49	0.5	20	88.2	0.85	18	127.5	1.25	16	176.5	2	14	245.2	3	12	294.2	Apply an axial pull-off load to crimped wire of contact secured on the tester. Operation Speed : 100 mm/min. AMP Spec. 109-5205 Condition
Wire Size		Crimp Tensile(min)																									
mm ²	(AWG)	N																									
0.3	22	49																									
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Fig. 1 (CONT.)

Para	Test Items	Requirements	Procedures
Mechanical Requirements			
3.5.17	Durability (Repeated Mate/Unmating)	10mΩ Max.(Final)	Operation by hand No. of Cycles : 30 cycles. AMP Spec. 109-5231
3.5.18	Vibration(High Frequency)	No electrical discontinuity greater than 1μ sec. Shall occur. 10 mΩ Max.(Final)	Vibration Frequency : 20→200→20 / 3 min. Accelerated Velocity : 44.1 m/s ² Vibration Direction: X , Y , Z Duration : X , Y 2hours each Z 4hours AMP Spec. 109-5202 Mounting : Fig.6
Environmental Requirements			
3.5.19	Temperature Life (Heat Aging)	10mΩ Max.(Final)	Mated connector 120°C, Duration: 5days AMP Spec. 109-5104
3.5.20	Resistance to Cold	10 mΩ Max.(Final)	Mated/unmated connector - 50°C ± 3°C, 120 hours AMP Spec. 109-5108
3.5.21	Thermal Shock	10mΩ Max.(Final)	Mated/Unmated connector - 30 ± 5°C / 120 min., 85 ± 5°C / 120 min. Making this a cycle, repeat 5 cycles. AMP Spec. 109-5103
3.5.22	Humidity, Steady State	Termination resistance 10mΩ Max.(Final)	Mated connector 90~95% R.H. 60°C 96hours AMP Spec. 109-5105
3.5.23	Salt Spray	10mΩ Max.(Final)	Subject mated/unmated connectors to 5% salt concentration for 96 hours AMP Spec. 109-5101
3.5.24	Dust Bombardment	10mΩ Max.(Final)	Mated/Unmated connector Subject JIS R 5210 cement blow of 14.7 N per 10 seconds in 15 minutes intervals for 90 minutes. AMP Spec. 109-5110

Fig. 1 (CONT.)

Para	Test Items	Requirements	Procedures
3.5.25	Industrial Gas (SO ₂)	10mΩ Max.(Final)	Mated/Unmated connector SO ₂ Gas:10 ppm, 95% R.H. 20 °C、 24 hours AMP Spec. 109-5107
3.5.26	Resistance to Oil	10mΩ Max.(Final)	Immerse mated connectors in oil. 50°C for 60 minutes. Fig.7. AMP Spec. 109-5113
3.5.27	Resistance to Ozone	29.4Pa(0.3kgf/cm ²) (Final)	Mated/Unmated connector 40°C, JIS K 6301 Ozone 50±5ppm. 24hours
3.5.28	Water Splash	10mΩ Max.(Final)	Expose mated connectors under 120±3°C for 40 minutes, splash Water for 20 minutes. 48 cycles, Test Voltage : 12 V AMP Spec. 109-5109
3.5.29	Watertight Sealing	49Pa(0.5kgf/cm ²) (Initial) 29.4Pa(0.3kgf/cm ²) (Final)	Blow compressed air at 9.8kPa(0.1kgf/cm ²) into mated connector through a small hole. Increase pressure by 9.8kPa(0.1kgf/cm ²) graduation until air leaks. AMP Spec. 109-5111

Fig. 1 (END)

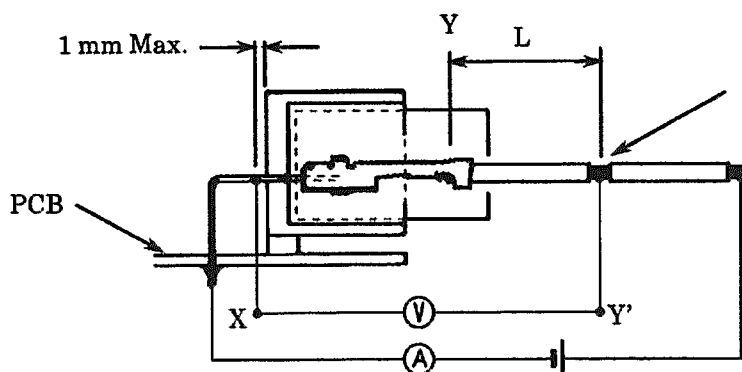
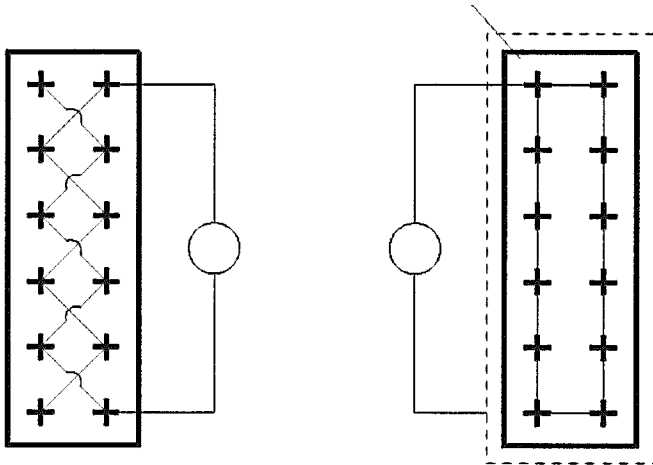


Fig.2

Conductive material is rolled in the surface of housing



Between Contact and Contact

Fig.3

Between Contact and Housing

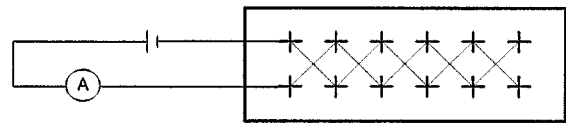


Fig.4

Positions	Reduction Factor
1	1
2~3	0.75
4~6	0.6
6~8	0.55
9~12	0.5
13 以上	0.4

Wire Size	Current
0.3 mm ²	DC 8 A
0.5 mm ²	DC 11 A
2.0 mm ²	DC 25 A
3.0 mm ²	DC 34 A

Current : I Max. · kd

Fig.5

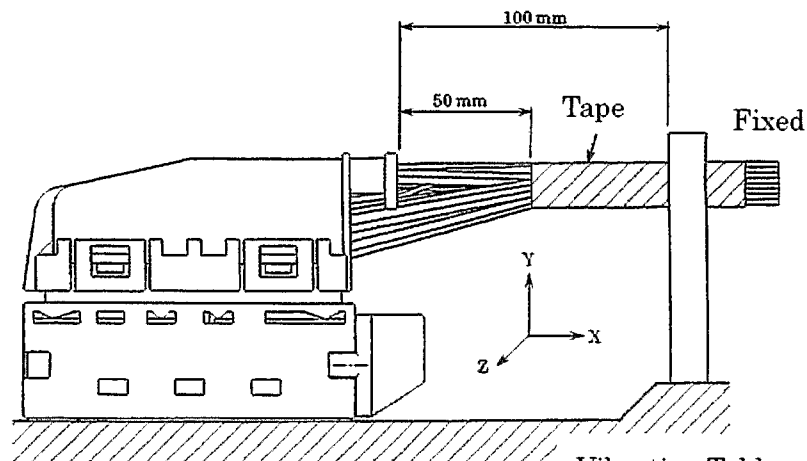


Fig.6

Vibration Table

Sequence	Name of Oil	Immersing time
1	Torque connertter oil	1 hour
2	Transmission oil	1 hour
3	Engine oil	1 hour
4	Clutch oil	1 hour
5	Brake oil	1 hour

Immerse in kerosene oil between each test for 5minutes.

Fig.7

The applicable product descriptions and part numbers are as shown in Appendix. 1.

Product Part No.	Name	Description
316874	Plug Housing Assembly	25Positions
316873	Cover	25Positions
1376600	Plug Housing Assembly	47Positions
1376601	Lever Assembly	47Positions
1612683	Plug Assembly	26Positions
1612684	Lever Assembly	26Positions
1674719	Lever Assembly Straight Type	26Positions
1717471	Plug Assembly	26Positions (Slide-Type)
1612691-2	Cover	26Positions
900293	060 Receptacle Contact	
316867	060 Rubber Plug	0.3~0.5sq
967067	060 Rubber Plug	0.85sq
175090	187 Receptacle Contact	(S)
175091	187 Receptacle Contact	(M)
1473234	060 Cavity Plug	
1674698	Cap Housing Assembly	25Positions
...	ABS UNIT Connector	

Appendix 1