

108-5113

Customer Release
AMP SECURITY CLASSIFICATION

108-5113

Product Specification

1-Position, Positive Lock Connector

1. Scope:

This specification covers general requirements for product performance and test methods of 1-position, positive lock connector.

2. Product Part Numbers and Nomenclature:

This product line consists of the following members of terminating components.

Part Numbers	Product Descriptions
170234-1 170234-2	Positive Lock Receptacle Contact
170233-1 170233-2	Positive Lock Receptacle Contact
171809	1-Position, Positive Lock Housing

3. Definition of Terms:

The terms used in this specification shall be defined as follows.

3.1 Contact: A contact is an electrically conductive member of component used in a connector assembly.

3.2 Housing: A housing is an electrically insulating member of component used in a connector assembly.

3.3 Connector: A connector is an assembly of a housing and contacts, properly arranged to fit for terminating functions. Usually, contact positions are fully filled with wire-crimped contacts.

4. Materials and Finish:

4.1 Contact: Contacts are made of brass conforming to Alloy No. 260 of ASTM B36. Either plain or post tinned products are available, depending upon the part type used.

4.2 Housing: Housings are made of molded 6/6 NYLON resin.

E1	Revised FJ00-1164-00	KS	CHK	7/9/00					
E	Revised FJ00-0882-93	SO	20						
D	Revised RFA-1959	KF	27	3/3/00	DR	<i>Y. Yamamoto</i>	78		
C1	Revised RFA-1481	YK	24	1-24	CHK	<i>Y. Yamamoto</i>	78		
C	Revised per RFA-427	YK	27	1-27	APR	<i>Y. Yamamoto</i>	78		
B	Revised per RFA-373								
A	Revised per RFA-335 & Translated								
LTR	REVISION RECORD	DR	CHK	DATE	SHEET		NAME	Product Specification	
					1 OF 10			1-Pos. Positive Lock Connector	

AMP Tyco Electronics AMP K.K.
Kawasaki, Japan

LOC: J A NO: 108-5113 REV: E1

5. Product Construction, Feature and Dimensions:

5.1 Receptacle Contacts:

Product construction, feature and dimensions shall be conforming to the applicable customer product drawing(s). Receptacle contacts shall have proper construction to fit for wire termination encapsulated in housing after wire crimping, and secured in the cavity by means of locking device and function as a female contact. When mated with counterpart tab contact, locking detent on the contact hooks up to assure stable connection. To release locking, pulling to separate the connector halves will suffice the action. Locking detent acts in effect when the contacts are pulled by lead wires at crimped barrels.

5.2 Housing:

Product construction, feature and dimensions shall be conforming to the applicable customer product drawing(s). The detent lock device provided on the bottom of housing cavities catches in the contact slot to retain the contact in position. When to remove the contact from housing cavity, apply force to bend the bottom of housing so that the detent is unlocked and contact can be removed by pulling it by hand.

6. Rating:

6.1 Temperature Rating:

Temperature rating of the product shall be within -40 thru + 105°C, including ambient temperature and temperature rising by the effect of energized electric load.

6.2 Applicable Wires to Be Used:


To this product application, the wires conforming to JIS C 3406, Low-Voltage Cables for Automobile, of the specified sizes must be used.

Wire Size	Part Nos.	—	154718-1 170233-1	170234-1
Wire Size mm ² Conductor(AWG)	—	—	0.5 - 2.0 (#20 - #14)	3.0 - 5.0 (#12 - #10)
Insulation Diameter mm	—	—	2.2 - 3.1	3.8 - 4.9

7. Performance Characteristics and Test Methods:

7.1 Performance:

When tested in accordance with the test method specified in Para. 7.2, in the sequence specified in Para. 7.3, the products shall be conforming to the requirements specified in Table 1.

SHEET		 Tyco Electronics AMP K.K. Kawasaki, Japan			
2 OF 10					LOC
		J	A	108-5113	E1
NAME Product Specification					
1-Pos. Positive Lock Connector					

108-5113

NUMBER

Customer Release

AMP SECURITY CLASSIFICATION

Test Items	Para-graph	Initial Performance Requirements	Performance Requirements After Physical and Environmental Test Conditioning	
Appearance	7.2.1	No evidence of defects such as cracks, breakage, damages, rattling and loose of parts, rust, void and fusion that are detrimental to connector functions shall be present.		
Connector Insertion Force	7.2.2	-1 5.9 - 39 N (0.5 - 4.0 kgf)	Mating/Unmating Commonly applied	
Connector Extraction Force	7.2.3	-2 4.9 - 44 N (0.5 - 4.5 kgf)	" " "	
Termination Resistance	7.2.4	All the values must not exceed 3mV/A.	All the values must not exceed 6 mV/A.	
Handling Touch of Contacts at Insertion and Extraction	7.2.5	No abnormal touch shall be perceived that results pain in assembly operator's hand.		
Insulation Resistance	7.2.6	The tested value shall be not less than 100MΩ.		
Dielectric Strength	7.2.7	No evidence of dielectric break-down or flashover shall be present after applying 1,800V AC for 1 minute.		
Contact Retention Force in Housing	7.2.8	The contact retention force shall be not less than 39 N (4kgf)		
Contact Locking Retention Force	7.2.9	The contact locking retention force shall be not less than 98 N (10 kgf)		
Crimp Tensile Strength	7.2.10	Crimp tensile strength shall be not less than the values shown below.		
		(Min.)		
			N	(kgf)
		0.5 mm ² (#16AWG)	88	9.0
		0.85mm ² (#18AWG)	127	13.0
		1.25mm ² (#16AWG)	167	17.0
		2.0mm ² (#14AWG)	245	25.0
3.0mm ² (#12AWG)	343	35.0		
5.0mm ² (#10AWG)	343	35.0		
Vibration, High Frequency	7.2.11	//		
Physical Shock	7.2.12			
Thermal Shock	7.2.13			
Salt Spray	7.2.14			
When tested in accordance with the test method specified in Table 3, product performance shall be conforming to the requirements specified in respective paragraphs.				

Table 1

SHEET		AMP Tyoo Electronics AMP K.K. Kawasaki, Japan		
3 OF 10		LOG	NO	REV
		J	A	E
		108-5113		
NAME Product Specification				
1-Pos. Positive Lock Connector				

7.2 Test Methods:

7.2.1 Appearance:

Inspect the product visually and tactually for conformance of product drawing(s), and check for presence of abnormalities such as cracks, breakage, damages, rattling and loose of parts, rust, voids, fusion and deformation that are detrimental to connector functions.

7.2.2 Connector Insertion Force:

Fasten one of a mating pair of connectors on the head of tensile testing machine and apply an axial load to insert the counterpart connector assembly by operating the head to travel with the speed at a rate of 100mm a minute.

7.2.3 Connector Extraction Force:

Fasten one of the mated pair of connectors on the head of tensile testing machine and apply an axial pull off load to unmate the connector halves by operating the head to travel with the speed at a rate of 100mm a minutes. The force required to unmate the connectors without locking devices set in effect shall be measured and recorded.

7.2.4 Termination Resistance:

Termination resistance is obtained by measurement of millivolt drop between the probing points across wire termination by applying test current of 1 A at open circuit voltage of 12V DC. Measurement shall be done after temperature rising of circuit becomes stabilized by probing at the point 75mm apart from the wire termination in the circuit. (Across Y and Y' in Fig. 1) Termination resistance shall be calculated from the millivolt drop reading, after deducting the wire resistance of a 75mm long crimped wire.

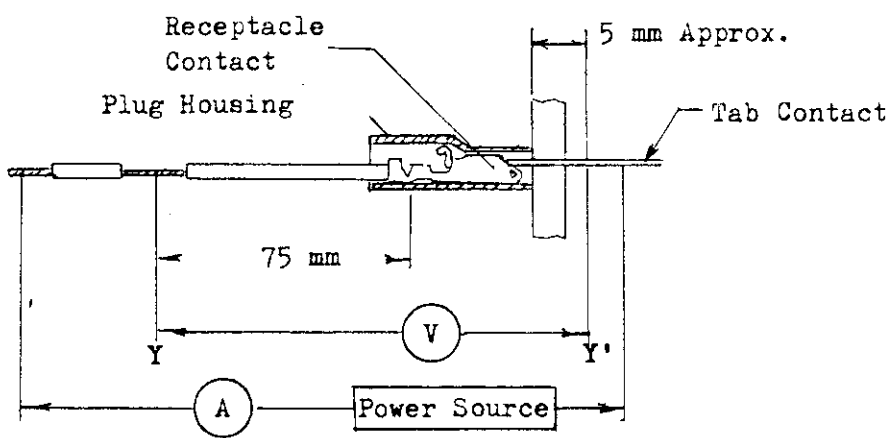


Fig. 1

SHEET		Tyco Electronics AMP K.K. Kawasaki, Japan		
4 OF 10		LOG	NO	REV
		J	A	E ₁
		108-5113		
NAME Product Specification				
1-Pos. Positive Lock Connector				

7.2.5 Handling Touch of Contact at Insertion and Extraction:

Manually repeat insertion and extraction of contacts in the manner as performed in production assembly work, and tactually confirm that no abnormal touch is felt that causes excessive fatigue or physical pains at assembly.

7.2.6 Insulation Resistance:

Mated pair of connector assemblies shall be tested by applying test potential between the contacts and the ground after the connectors are wrapped with metallic foil as shown in Fig. 2. Potential intensity shall be 500V DC.

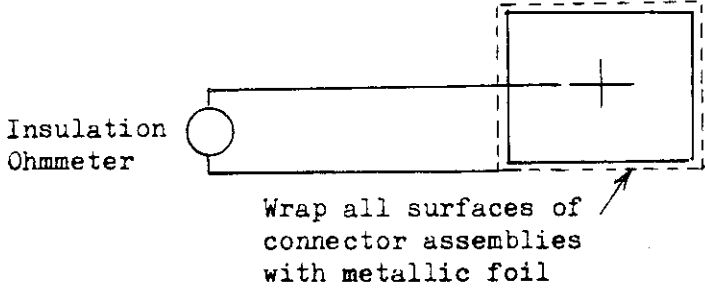


Fig. 2

7.2.7 Dielectric Strength:

Mated pair of connector assemblies shall be tested by applying test potential of 1,800V AC of commercial frequencies for 1 minute between the contacts and the ground.

7.2.8 Contact Retention Force:

An approximately 100 mm long, 0.85mm² wire crimped contact shall be loaded in connector cavity position and secured by setting locking device in effect. The connector assembly shall be fastened on the tensile testing machine, and apply an axial pull-off load to the crimped wire end by operating the head to travel with the speed at a rate of 100mm a minute uniformly. Contact retention force is determined when the contact is dislodged from the loaded position.

7.2.9 Contact Locking Retention Force:

Have a pair of connector housings filled with contacts that are crimped with approximately 100 long 0.85mm² or greater size wire, and mate them with locking device set in effect. Fasten tab contact side of the connectors onto the head of tensile testing machine, and apply an axial pull-off load to the counterpart connector to unmate by operating the head to travel with the speed at a rate of 100mm a minute uniformly. Contact locking retention force is determined when the connector halves are separated by disengagement or breakage of contact locking device.

SHEET	AMP Tyco Electronics AMP K.K. Kawasaki, Japan			
5 OF 10	LOC J	NO A	NO 108-5113	REV. E1
NAME Product Specification				
1-Pos. Positive Lock Connector				

7.2.10 Crimp Tensile Strength:

Fasten an approximately 100mm long wire crimped contact onto the head of tensile testing machine, and apply an axial pull-off load to the wire by operating the head to travel with the speed at a rate of 100mm a minute. Crimp tensile strength is determined when the wire is broken or is pulled out of the wire crimp.

7.2.11 Vibration, High Frequency:

Mated pair of connector assemblies shall be fastened on the vibration testing table with all the contact cavities filled with wire-crimped contacts which are series-wired and energized with the test current of 3A at open circuit voltage of 12V DC as shown in Fig. 3. The testing table shall be vibrated with accelerated velocity of 44m/s^2 (4.5G) in reciprocating sweeping frequencies to travel from 20 to 200Hz. at a rate of one cycle a minute. Vibration shall be applied in three axial directions of connector assemblies for 8 hours each direction. While testing the test circuit shall be monitored by appropriate measuring apparatus for the loss of electrical continuity greater than $1\ \mu\text{second}$. The sensitivity of loss detector shall be provided to detect millivolt drop of 1V/A in the circuit.

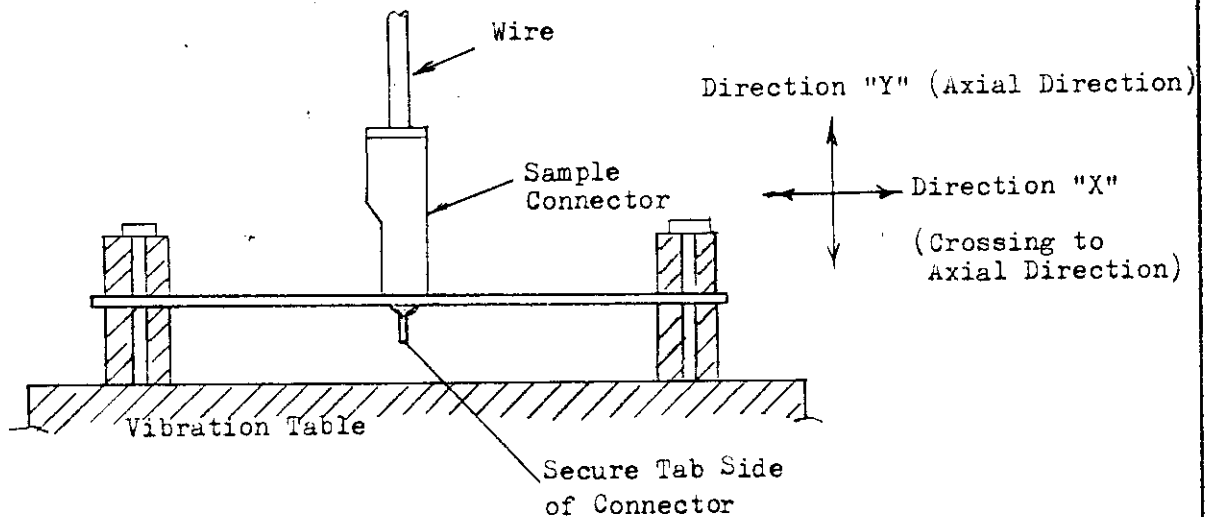


Fig 3

7.2.12 Vibration Low Frequency:

Contact-loaded and mated pair of connector assemblies shall be tested by using vibration testing machine conforming to SAE J577 after mounting the connectors with all the contacts series-wired as shown in Fig. 3. Vibration shall be such that shaken by rotating cam drop to vibrate 3.2mm in 12.5Hz given to the vibration testing plate whose free end is supported by spring tension of 265-314 N (27-32 kgf) in "X" and "Y" directions as indicated in Fig. 3 for 1 hour each direction respectively. While vibrating, the circuit is energized with closed circuit test current of 1A at open circuit voltage of 12V, and monitored for the loss of electrical continuity greater than $1\ \mu\text{second}$ taking place in the circuit. Discontinuity indication level shall be adjusted to sense millivolt drop of 1V/A in the circuit.

SHEET	AMP Tyco Electronics AMP K.K. Kawasaki, Japan		
6 OF 10	LOC J	NO A	NO 108-5113
NAME	Product Specification		
	1-Pos. Positive Lock Connector		
			REV E1

7.2.13 Thermal Shock:

Mated pair of connector assemblies shall be exposed under 5 cycles of test temperature variation as specified in Table 2 below. After completion of test duration, the sample connectors shall be removed from the oven and reconditioned in the room temperature before performing the further tests as specified.

Test Sequence	Test Conditions	Duration
1	Exposed under elevated temperature at $105 \pm 5^{\circ}\text{C}$	30 minutes
2	Reconditioned in the room temperature	5 minutes max.
3	Exposed under cold temperature at $-40 \pm 5^{\circ}\text{C}$	30 minutes
4	Reconditioned in the room temperature	5 minutes max.
One rotation of the sequence makes 1 cycle.		

Table 2

7.2.14 Salt Spray:

Mated pair of connector assemblies shall be tested in accordance with JIS-C-5028 for 2 cycles of 1 hour exposure with 1 hour off load interval taken between the cycles. After completion of test duration, sample connector shall be removed from the test chamber, and rinsed in the tap water and dried in the room temperature for 1 hour, before performing the further tests as specified.

7.3 Test Sequence:

All the tests shall be conducted in accordance with the test sequence as specified in Table 3.

SHEET	AMP Tyco Electronics AMP K.K. Kawasaki, Japan		
7 OF 10	LOC J	NO A	108-5113
NAME Product Specification			
1-Pos. Positive Lock Connector			

103-5113

CLASSIFICATION
Release

Test Items	Sample Groups	Test Sequence					
		I	II				III
Appearance		1					
Connector Insertion Force		2					
Connector Extraction Force		4					
Termination Resistance		3				10	
Handling Touch of Contacts at Insertion and Extraction		7				11	
Insulation Resistance		5					
Dielectric Strength		6					
Contact Locking Retention Force		8				12	
Contact Retention Force		9					
Crimp Tensile Strength							1
Vibration, High Frequencies			3				
Vibration, Low Frequencies				5			
Thermal Shock					7		
Salt Spray						9	

Table 3

8. Quality Assurance Provisions:

8.1 Test Conditions:

All the tests shall be conducted in any combination of the following test conditions, unless otherwise specified.

- Temperature 15 - 35°C
- Relative Humidity: 45 - 75%
- Atmospheric Pressure: 86.7 - 107kPa
(650 - 800mmHg)

8.2 Tests:

8.2.1 Test Specimens:

All the test specimens to be used for the tests shall be prepared in accordance with AMP Application Specifications, 114-5032, Crimping Positive Lock Receptacle (Domestic Products) and 114-5032, Crimping Positive Lock Receptacle, by using the wires of the sizes specified in Table 4. Test specimens used for this evaluation should not have Bend-up, down, twist, rolling of more than 5 degrees. Unless otherwise specified no sample shall be reused.

SHEET		AMP Tyco Electronics AMP K.K. Kawasaki, Japan	
8 OF 10			
LOC	J A	NO	103-5113
REV	E1		
NAME Product Specification			
1-Pos. Positive Lock Connector			

8.2.2 Number of Test Specimens:

Number of test specimens shall be not less than 10 sets per each sample group.

8.2.3 Applicable Tab Contacts:

Tab contact used for the tests shall be conforming to the specified drawing shown in Fig. 4. However, for testing insertion/extraction force of -2 receptacle (tin-plated), tin-plated brass tab shall be used.

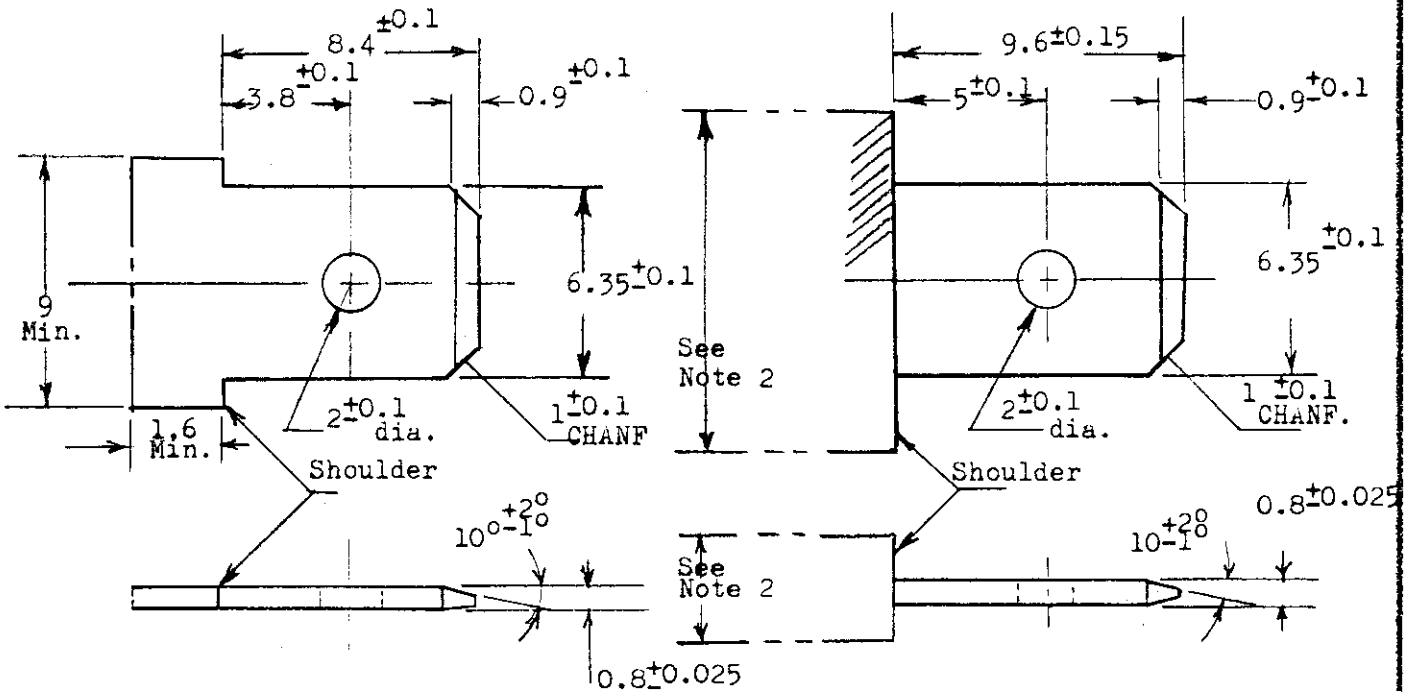


Fig. 4-1

Fig. 4-2

When to mate with bare contact tab, tip end of receptacle contact must be bottomed at tab shoulder.

When to mate with plastics molded contact tab, receptacle must be bottomed on the surface of molded tab shoulder as shown.

- Note: (1) Refer to AMP Customer Product Drawing 116-5070 for fabrication of tab conforming to this specification.
 (2) Thickness of molded plastic shoulder must be 9mm min. in width, and 5.4mm min. in tab thickness direction.

SHEET		AMP Tyco Electronics AMP K.K. Kawasaki, Japan		
9 OF 10	LOC J	NO A	108-5113	REV E1
NAME Product Specification				
1-Pos. Positive Lock Connector				

8.2.4 Applicable Wire Specification:

For preparation of test specimens, the wires conforming to Table 4 must be used.

Wire Size		Strand Composition		Cross-sectional Area	
Nominal mm ²	(AWG)	Diameter of Strand (mm)	Number of Strands	mm ²	CMA
0.85	(#18)	0.32	11	0.88	1,746
1.25	(#16)	0.32	16	1.28	2,540
2.0	(#14)	0.32	26	2.09	4,128
3.0	(#12)	0.32	41	3.30	6,509
5.0	(#10)	0.32	65	5.23	10,319

Table 4

9. Applicable Documents:

- JASO 7002 Automotive Multipole Connector
- JASO 7101 Test Methods for Molded Plastic Parts
- JIS C 3406 Low Voltage Cable for Automobiles
- JIS D 0204 Method of Moisture, Rain and Spray Test for Automobile Parts
- JIS D 1601 Vibratile Testing Method for Automobile Parts
- JIS D 5500 Lighting and Signalling Equipment for Automobiles
- JIS C 5028 Salt Mist Testing Method for Electronic Component Parts
- SAE J 577 Vibration Test Machine

- 114-5029 AMP Application Specification, Crimping Positive Lock Receptacle Contacts
- 114-5032 Ditto, (Applicable to Domestically Manufactured Products)

SHEET		AMP Tyco Electronics AMP K.K. Kawasaki, Japan			
10	OF 10	LOC	A	NO	108-5113
		J			REV. E
NAME Product Specification					
1-Pos. Positive Lock Connector					