

108-5048

Design Objectives

"250" FASTIN-FASTON* Connector

1. Scope:

In case when "product specification" is referred to in this document, it should be read as "design objectives" for all times as applicable.

1.1 Scope:

This specification covers general requirements for product performance and test methods of Multi-circuit 250 FASTIN-FASTON* connectors of the part numbers listed in Para. 1.1.1.

1.1.1 Applicable Product Part Numbers:

The following product part numbers shall be governed under this product specification.

480173-1 8-Position Receptacle Housing

480174-1 8-Position Tab Housing

171432-1 6-Position Receptacle Housing

171433-1 6-Position Tab Housing

170151-1/-2 Tab Contacts

170092-3/-4 Receptacle Contacts

DESIGN OBJECTIVES

The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, AMP Incorporated makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, AMP Incorporated may change these requirements based on the results of additional testing and evaluation. Contact AMP Engineering for further details.

1.2 Product Description:

A pair of connector assembly consists of multi-circuit receptacle housing that accommodates receptacle (female) contacts, and tab housing of corresponding number of positions that accommodates tab (male) contacts. They can form a multi-circuit termination by mating.

2. Applicable Documents:

The following specifications and standard form part of this specification to the extent specified, herein.

A.S.T.M. B36 Alloy No. 260: Brass Plate, Sheet, Strip and Rolled Bar

JIS-C-3406: Low-Voltage Cables for Automobiles

JASO 7002: Multi-Connector Automobiles

MIL-STD-202: Test Methods for Electric and Electronic Parts

Ref. A.S.T.M. = American Society for Testing Materials, U.S.A.

JIS = Japanese Industrial Standards, Japanese Standards Association

JASO = Japanese Automobile Standard Organization

MIL-STD = Military Standards, U.S.A.

3. Product Design, Feature and Construction:

3.1 Material:

Materials used to fabricate products shall be conforming to the applicable product drawings.

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AMP SECURITY CLASSIFICATION

DATE LIST

			GR 9-2-78	AMP	AMP (Japan), Ltd. TOKYO, JAPAN
			APP 9-12-78	LOG	NO 108-5048
C1	REVISED RFA-1892	10/2			REV C1
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REVISION RECORD			DR. CHN	DATE	
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3.2 Product Design Feature, Construction and Dimensions:

Product design feature, construction and dimensions shall be conforming to the applicable product drawings.

4. Performance Requirements:

4.1 Electrical Performance

4.1.1 Termination Resistance:

When tested in accordance with the test method specified in Para. 5.3.1, termination resistance of (1) Wire Crimp of Tab Contact, (2) Frictional Mating Area and (3) Wire Crimp of Receptacle Contact, in total shall show value not greater than those specified in Table 1.

Wire Size mm ² (AWG)	Test Current (A)	Millivolt Drop (mV/A)	Temperature Rising (°C)
0.85(#18)	7	3.0	20
1.25(#16)	10	3.0	30
2.0 (#14)	15	3.0	30

Table 1

4.1.2 Termination Resistance of Frictional Contact Area:

When tested in accordance with the test method specified in Para. 5.3.1, termination resistance of frictional contact area only, shall be not greater than 2mΩ.

4.1.3 Temperature Rising:

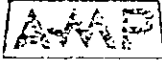
When tested in accordance with the test method specified in Para. 5.3.1, temperature rising of the receptacle contact shall not exceed the value specified in Table 1.

4.2.4 Insulation Resistance:

When tested in accordance with the test method specified in Para. 5.3.2, insulation resistance between adjacent contacts, and between the contacts and the ground shall be not less than 1,000Ω.

4.2.5 Dielectric Strength:

When tested in accordance with the test method specified in Para. 5.3.3, connector shall show no abnormalities being capable to withstand the test potential of 1,000V AC applied across the adjacent contacts, and across the contacts and the ground for 1 minute

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4.3 Mechanical Performance:

4.3.1 Contact Retention Force:

When tested in accordance with the test method specified in Para. 5.3.4, contact retention force on housing shall be not less than 5.5 kg.

4.3.2 Connector Insertion/Extraction Force:

When tested in accordance with the test method specified in Para.5.3.5, insertion and extraction force of a pair of connector assemblies shall be conforming to the values specified in Table 2.

Insertion Force (Max.)	Extraction Force (Min.)
4.0 kg	0.5 kg

Table 2

4.3.3 Crimp Tensile Strength:

When tested in accordance with the test method specified in Para. 5.3.6, crimp tensile strength of tab and receptacle contact shall be conforming to the values specified in Table 3.

Wire Size mm ² (AWG)	Tensile Strength (Min.)	
	kg	(lbs.)
0.85 (#18)	15.0	(33.0)
1.25 (#16)	20.0	(44.1)
2.0 (#14)	28.0	(61.7)

Table 3

4.4 Environmental Performance:

4.4.1 Vibration (High Frequency):


When tested in accordance with the test method specified in Para. 5.3.7, connector shall show no abnormalities such as wire breakage or dislodge of contact from housing etc.

4.4.2 Heat Resistibility:

When tested in accordance with the test method specified in Para. 5.3.8, connector shall show no abnormalities detrimental to connector functions.

4.4.3 Cold Resistibility:

When tested in accordance with the test method specified in Para. 5.3.9, connector shall show no abnormalities detrimental to connector functions.

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4.4.4 Oil Resistibility:

When tested in accordance with the test method specified in Para. 5.3.10, connector shall show no abnormalities detrimental to connector functions.

4.4.5 Aging:

When tested in accordance with the test method specified in Pra. 5-3.11, insertion/extraction force and termination resistance of connector shall be conforming to the specified value.

5. Quality Assurance Provisions:

5.1 Test Conditions:

All the tests shall be performed under any combination of the following test conditions.

Room Temperature:	15	-	35°C
Relative Humidity:	45	-	75%
Atmospheric Pressure:	650	-	800mmHg

5.2 Test Specimens:

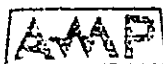
All the product specimens, emplyed for the tests, shall be prepared by using applicable tooling at the correct crimp height specified in Table 4. No sample shall be reused, unless otherwise specified.

5.2.1 Wires Used:

All the wires used and tested under this product specification, shall be conforming to JIS C 3406, Low-Voltage Cables for Automobile, as shown in Table 4.

Wire mm ²	Size (AWG)	Composition of Conductor	
		Diameter of a Strand (mm)	Number of Strands
0.85	(#18)	0.32	11
1.25	(#16)	0.32	16
2.0	(#14)	0.32	22

Table 4

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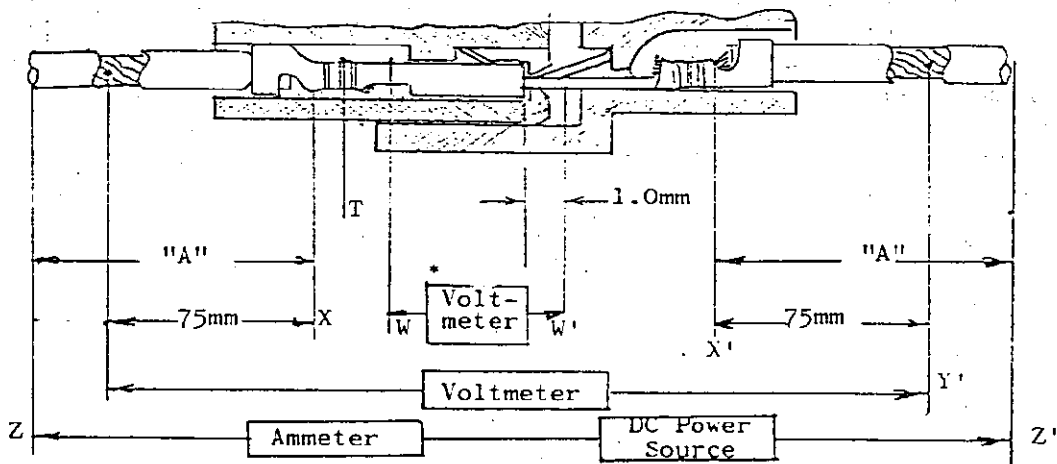
5.3 Test Methods:

5.3.1 Termination Resistance, Temperature Rising and Termination Resistance of Frictional Contact Area:

Wire-crimped, housing-installed receptacle contacts shall be tested for termination resistance by millivolt drop method. As shown in Fig. 1, DC test current power source shall be connected to Z - Z', the both ends of wire termination across tab-receptacle mated area. The crimped wire shall be longer than 90 cm (3 ft. approx.) for sufficient effect of heat dissipation. After temperature rising of the test circuit becomes stabilized, measure millivolt drop across Y - Y', including the sections of (1) wire crimp of tab contact, (2) frictional contact area and (3) wire crimp of receptacle contact by using DC voltmeter.

The measured value includes resistance of crimped wires of 75mm in length, therefore, after deducting the resistance value equal to a 150mm-long wire by calculation, measure the millivolt drop across X - X' in the test circuit. Temperature rising of the test circuit shall be measured by applying test current specified in Table 1, and after temperature rising becomes stabilized, probe at the point "T" with thermocouple.

Termination resistance of frictional contact area of contacts shall be tested by measuring millivolt drop across frictional contact area at probing points W - W' under the test current specified in Table 1, on mated pair of contacts without being installed in housing.



- A: Crimp lead wire longer than 400mm approximately for sufficient effect of heat dissipation.
- Y-Y': Remove insulation and uniformly solder for obtaining stable measurement reading by probes.
- W: On the back of transition portion of receptacle contact
- W': On tab contact 1.0mm apart from mating edge of receptacle contact
- W-W': To measure this section only, contacts are not installed in housing.
- T: Probing point for thermocouple

Fig. 1 Millivolt Method

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5.3.2 Insulation Resistance:

Insulation resistance of connector is measured in accordance with Test Condition B, Test Method 302 of MIL-STD-202, by applying test potential of 500V between adjacent contacts, and between the contacts and the ground in the mated connector assemblies.

5.3.3 Dielectric Strength:

Dielectric strength of connector assembly is measured in accordance with Test Method 301 of MIL-STD-202, by applying test potential between the adjacent contacts, and between the contacts and the ground.

5.3.4 Contact Retention Force:

Wire-crimped tab contact and receptacle contact are installed in respective housing assembly, and fasten on the head of tensile testing machine. Contact retention force is measured by operating the head to travel with the speed at the rate of 100mm a minute. Contact retention force is determined when the contact is dislodged from housing or wire is broken.

5.3.5 Connector Insertion/Extraction Force:

Contact-loaded mating pair of connector assemblies are fastened on tensile testing machine, and tested for insertion/extraction force by operating the head to mate together or extract with the speed at a rate of 100mm a minute. The force required to mate and unmate shall be measured.

5.3.6 Crimp Tensile Strength:

Wire-crimped contact is fastened on the head of tensile testing machine, and crimp tensile strength is measured 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 off from wire crimp.

5.3.7 Vibration (High Frequency):

Contact-loaded and mated pair of connector assemblies shall be tested for vibration in accordance with Test Method Para. 6.5 of JASO 7002, by fastening them on vibration testing machine, with the crimped wire leads to span a distance of 300mm between fastening clamps in the condition not being too slack as shown in Fig. 2. Vibratile test conditioning is applied with the vibration frequency of 2000cpm, at accelerated velocity of 4.5G's for 8 hours.

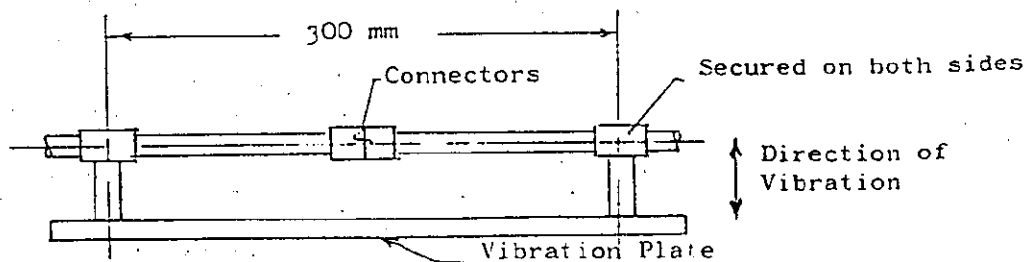


Fig. 2 Vibration Test

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5.3.8 Heat Resistibility:

Housing shall be tested in accordance with Test Method per Para. 6.7 of JASO 7002, by exposing under heat at $80 \pm 2^\circ\text{C}$ in test oven for 24 hours. After completion of conditioning term, housing shall be cooled in room temperature for 1 hour.

5.3.9 Cold Resistibility:

Housing shall be tested in accordance with Test Method per Para. 6.7 of JASO 7002, by exposing under chilled atmosphere at $-30 \pm 2^\circ\text{C}$ in the test chamber for 3 hours. After completion of conditioning, housing shall be dropped from the height of 500mm onto a 5mm (min.) thick iron plate, instantly after removal from the test chamber.

5.3.10 Oil Resistibility:

Housing shall be tested in accordance with Test Method per Para. 6.8 of JASO 7002, by immersing in an mixture of engine oil (SAE 10W) or equivalent, and equalized volume of kerosene, conforming to Class 2 of JIS K 2203, at $50 \pm 2^\circ\text{C}$ for 20 hours. After completion of conditioning, sample housing shall be removed from the tub, and reconditioned in room temperature.

5.3.11 Aging:

Mated pair of connector assemblies shall be tested in accordance with Test Method per Para. 6.9 of JASO 7002, by exposing under the testing atmosphere with the temperature changing between the extremes in the sequence specified in Table 5, at a rate of a cycle a day. At the end of every cycle except the 5th. cycle, sample housing assemblies are dried in the room temperature in the condition as shown in Fig. 3. Step 5 is deleted in 5 th. cycle. After conditioning, connector assemblies shall be tested for connector insertion/extraction force per Para. 4.3.2, and for termination resistance per Para. 4.1.1.

Sequence	Conditioning Atmosphere
1	3 hours' exposure at $-30 \pm 2^\circ\text{C}$
2	Reconditioned in room temperature for 30 minutes
3	3 hours' exposure at $80 \pm 2^\circ\text{C}$
4	Reconditioned in room temperature for 30 minutes
5	Immersion in water at $20 \pm 2^\circ\text{C}$ for 1 minute

Table 5

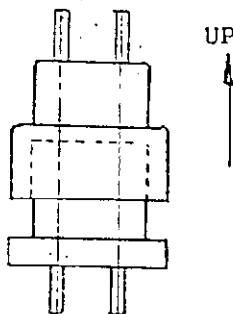


Fig. 3

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