QUALIFICATION TEST REPORT

AIR BAG CONNECTOR SYSTEM 24 + 24 POSITION

(MICRO QUADLOK CONTACTS , PLUS SHORT CIRCUIT BARS, OR SHUNTS)

tyco Electronics

AMP

REV LTR	REVISION RECORD	DR	DATE	CHK	DATE
B	ET00-0029-02 Added New Polarization	G.P.C	08/02/02	G.P.C	25/02/02
A	Active	G.P.C.	18/07/01	M.B.	20/01/01
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CHK

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NUMBER 501-20 030

REV B

NAME AIR BAG CONNECTOR SYSTEM 24+24 POSITION

QTR 501-20030

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QUALIFICATION TEST REPORT

1. INTRODUCTION

1.1 Purpose

This document summarizes all Testing Activities made by AMP Italia performed on the Subject AMP Product and estabilishes its conformance to the requirements of the FIAT Customer specifications as reported below.

1.2 Scope

This report covers the requirements of AMP Specification 108-20.202 rev A2, as mechanical, electrical and environmental performance for 24+24 Pos. Connector for Air Bag System, as required by the FIAT-AUTO and AMP Product Specification.

1.3 Conclusion

The 24+24 Pos. Connector family, equipped with MicroQuadLok System contact and Shunt contacts, meets all the mechanical, electrical and environmental performance requirements of FIAT-AUTO and AMP Product Specification.

1.4 Product Description

The Product is made by a Rec. Housing, suitable to house 24+24 MQS contacts, gold plated version, and 6 contacts of Shunts, gold plated version. They are suitable to meet the male connector counterpart made as component part of the ignition key assembly system.

1.5 Test Samples

Test samples were randomly selected from pre-production lots, and the following Part Numbers were used for tests :

TABLE 1

Header 24 +32 Pos	1355737
Header 24 +24 Pos	953621
Housing for 24+24 Pos. with	284224-1,-2,-5,-6,-7
Short Circuit Jumper (Bar)	953223-1
24 Pos. Kit Assembly	284223-3,-4,-5,-6,-7
MQS contact gold version	144969-2

1.6 Test Sequence

The following test sequence was carried out to assure compliance of the subject product to the FIAT Specifications 9.91320/02 :

ITEM	DESCRIPTION	A	B	C	D	E	F	G	H	I	L	M	N
2.1	Visual examination	1,9, 11	1,3	1,3	1,3	1,6	1,4	1,5	1,6	1,4	1,6	1,5	1,5
2.7	Connector Mating force	2,6											
2.8	Connector Unmating force	4,8											
-	Durability	5											
2.9	Connect. locking strength	10											
2.10	Contact Retention Force			2									
2.11	Lever Retention Force						3						
2.12	Contact Insertion Force		2										
2.13.1	Retent. Force Housing/ Frame						2						
2.14	Sec.Lock Effectiveness				2								
2.15	Connector Polarization effectiveness					5							
2.16	Vibration Random					3							

2. 2	MilliVoltDrop	,7				2,4		2,4	2,5	2,4	2,4	2,4	2,4
2.4	Dielectric strength								4				
2.3	Insulation resistance								3		5		
2.5	Temp. Rise (in oven)									3			
2. 6	Current overload							3					
2.17	Thermal Cumulativecycling										3		
2.18	Salt spray											3	
2.19	Kesternick corrosion												3

The number inside each Test Group indicates the sequences in which Tests were performed.

2. SUMMARY OF TESTING

*N° of paragraph of Amp Product Specification 108-20202

2.1 Examination of Product

All samples submitted for testing were selected from pre-production lots. They were inspected as required by Product Spec at the point 1.9* and accepted by Quality Assurance as conformal to Drawings.

2.2 Millivolt Drop

Test was performed as indicated at point 3. 1* , on 20 pieces each, tab-female contacts.

The following values were found:

Samples as received :

MQS Contacts

For contacts crimped onto 0,5 sqmm : from 1,6 to 3,6 mV/A Average 2,88 mV/A

For contacts crimped onto 0,35 sqmm : from 2,8 to 4,5 mV/A Average 3,5 mV/A

Target <5 mV/A

All tested samples were within the specification limits.

2.3 Insulation Resistance

Test was performed as indicated at point 3.3*, on 2 complete connectors.

Both tested samples succeded to pass the requirement of 10 Mohm, min.between adiacent contacts.

2.4 Dielectric Withstanding Voltage

Test was performed as indicated at point 3.2*, on 2 complete connectors.

Both connectors succeded to pass the requirement of 1000 Vac between adiacent contacts

2.5 Temperature Rise over Oven Temperature with Current Load - (ESERCIZIO GRAVOSO)

Test is performed as indicated at point 3.4*, on 1 complete connector having 6 A in 6 adiacent contacts.
Test repeated 5 times, with ambient temperature as rest conditioning between each exposure.
The contacts in position N° 4,5,6,7,8,9 were subject of the test.
Temperature Rises are withuin Specification Limits.

2.6 Current Overload

Test was not performed because we have considered already qualified the Micro QuadLok System contacts (see: Additional Test to Qualification Test Report from AMP Germany).

2.7 Connector Mating Force

Test was performed as indicated at point 2.1*, on 6 pieces, male-female connectors.

The following values were found:

Range of values of Mating Force , as received:

from 40,8 to 49,5 N Average 43,4 N

After 10 mating cycles,

from 25,8 to 29,5 N Average 27,4 N

Target < 50N

All the tested samples were within the specification limits.

2.8 Connector Unmating Force

Test was performed as indicated at point 2.2*, on 6 pieces male-female connectors.

The following values were found:

Range of values of Unmating Force , as received:

from 22,2 to 25,6 N Average 25,0 N

Target > 10N

Range of values of Unmating Force after 10 unmating cycles:

from 16,5 to 21,7 N Average 18,1 N

Target > 10 N

All the tested samples were within the specification limits.

2.9 Connector Locking Strength

Test was performed as indicated at point 2.3*, on 6 pieces male-female connectors.

All the tested samples withstood a Force of 100 N for one minute both applied to wire bundle axially and at 90 degree.

2.10 Retention Force Housing / Frame

Test was performed as indicated at point 2.4*, on 6 pieces Rec Housing-Frame connectors.

All the tested samples withstood a Force of 100 N for one minute applied to wire bundle axially.

2.11 Lever Retention when Closed

Test was performed as indicated at point 2.5*, on 6 pieces mated to the corresponding Header cavity.

All the tested samples withstood a Force of 100 N for 30 sec.applied to the lever without disengaging the lever from connectors.

2.12 Contact Insertion Force

Test was performed as indicated at the point 2.6*, on 5 pieces of MQS Contacts in a 24 pos conn. .

Range of values of Insertion Force , as received:

from 2.2 to 3.0 N Average 2.6 N

Target < 5 N

All tested samples were within specification limits.

2.13 Contact Extraction Force with primary locking

Test was performed as indicated at point 2.7*, on 5 pieces of MQS Contacts in 24 pos conn. .

Range of values of Extraction Force , as received:

from 67.3 to 72.7 N Average 70.8 N

Target > 60N min.

All tested samples were within specification limits.

2.14 Secondary Locking Effectiveness

Test is performed as indicated at point 2.8*, on 5 pieces, with one contact not fully inserted into its cavity .

Range of values of Effectiveness Force , as received:

(contacts in the row with shunts) from 88,5 to 107,8 N Average 95,7 N

(contacts in the row without shunts) from 82,3 to 89,6 N Average 85,3 N

Target : 80N Min

2.15 Connector Polarization Effectiveness

Test is performed as indicated at point 2.9*, on 5 pieces, assembled connectors, 180° rotated in the mating direction with the corresponding header cavity .

Target : 150N Min

All tested samples withstood 150 N, without mating the header counterpart.

2.16 Vibration Random

Test was performed as indicated at point 2.10*, on 2 complete connectors, each wire size.

After vibration :

For contacts crimped onto 0,35 sqmm : from 1,8 to 5,0 mV/A Average 3,3 mV/A

For contacts crimped onto 0,5 sqmm : from 3,3 to 4,6 mV/A Average 4,0 mV/A

All the tested samples have not shown micro discontinuities greater than 1 microsecond with an increase greater than 100 ohms.

All tested samples were within acceptable limits.

2.17 Thermal Cycling and Cumulative Ageing

Test was performed as indicated at point 4.1*, on 5 complete connectors.

No evidence of physical damage to either the contacts or the connectors was visible as a result of Thermal Cycling

Results:

After 5 cycles of Thermal Schocks, (+105°C-30°C) 4 hours each condition,:

For contacts crimped onto 0,35 sqmm : from 2.5 to 5,8 mV/A Average 3,9 mV/A

For contacts crimped onto 0, 5 sqmm : from 1,6 to 4,2 mV/A Average 3,2 mV/A

After Thermal Cycling, (+105°C, +40°C -95%R.H.,-30°C) 4 hours each condition:

For contacts crimped onto 0,35 sqmm : from 2,9 to 8,7 mV/A Average 4,5 mV/A

For contacts crimped onto 0,5 sqmm : from 1,8 to 5,8 mV/A Average 4,2 mV/A

After Accelerated Ageing, (200Hours at +105°C):

For contacts crimped onto 0,35 sqmm : from 2,2 to 9,5 mV/A Average 6,0 mV/A

For contacts crimped onto 0, 5 sqmm : from 1,5 to 7,5 mV/A Average 5,6 mV/A

Target < 10mV/A

All tested samples were within acceptable limits.

2.18 Salt Spray

Test was performed as indicated at point 4.2*, on 2 complete connectors without cover, contacts crimped on 0,35 sqmm only.

Range of values of MilliVolt Drop after Test:

from 2,2 to 3,2 mV/A Average 2,8 mV/A

Target: < 10 mV/A Max

All tested samples were within acceptable limits

2.19 Industrial Atmosphere - Kesternich Test

Test was performed as indicated at point 4.3*, on 2 complete connectors without cover, contacts crimped on 0,35 sqmm only.

Range of values of Contact Resistance after Test:

from 2,5 to 4,2 mV/A Average 3,2 mV/A

Target: < 10 mV/A Max

All tested samples were within acceptable limits

3. VALIDATION

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