

VALIDATION TEST REPORT

Product Description: 84P sealed plug for Bosch airbag

Test Type: Product Qualification

Issue Date: 14 August, 2013

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Test Results Overview

No.	Item	Qty	Test result			Requirement	Results	
			Max	Min	Ave			
Group1 Terminal – Connector Insertion/Extraction Force								
*1	Terminal - Connector Insertion Force(30P)	3	4.8	1.4	2.6	<30N	OK	
	Terminal - Connector Insertion Force(54P)	3	4.5	1.0	2.6	<30N	OK	
*2	Terminal - Connector Extraction Force(30p) Post humidity	3	124.8	78.5	112.6	>60N	OK	
	Terminal - Connector Extraction Force(54p) Post humidity	3	122.4	84.8	102.6	>60N	OK	
Group2: Connector to Connector Mating/ Un-mating Forces								
*1	Engage to pre-lock (30P)	10	27.7	12.3	19.8	<75N	OK	
	Engage to pre-lock (54P)		37.7	12.9	22.5	<75N	OK	
*2	Disengage from pre-lock (30P)		38.0	18.0	29.1	>15N,<75N	OK	
	Disengage from pre-lock (54P)		34.3	19.7	27.9	>15N,<75N	OK	
*3	Move Lever from ship position(30p)	10	68.9	51.3	59.2	>50N	OK	
	Move Lever from ship position(54p)		81.1	54.2	69.1	>50N	OK	
*4	Mating force (30P)	10	12.2	10.3	11.3	<75N	OK	
	Mating force (54P)		11.7	9.0	10.4	<75N	OK	
*5	Un-mating Force latch engaged(30P)		10	194.0	187.7	190.2	>110N	OK
	Un-mating Force latch engaged(54P)			247.9	222.8	232.9	>110N	OK
*6	Un-mating Force latch disengaged(30P)		10	7.5	6.2	7.0	<75N	OK
	Un-mating Force latch disengaged(54P)			7.0	5.0	5.9	<75N	OK
Group3: Miscellaneous Component Engage/Disengage Force								
*1	Insertion of Socket (30P)		10	27.9	11.8	17.1	<60N	OK
	Insertion of Socket (54P)	25.2		12.6	20.7	<60N	OK	

*2	Removal of Socket (30P)	10	185.2	110.5	139.2	>110N	OK	
	Removal of Socket (54P)		189.4	110.3	158.1	>110N	OK	
							Conclusion: OK	

P.S. The number with * is deployed in 6.

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1 Test Purpose

The purpose of this test is to confirm the performance of 84P sealed plug for Bosch airbag.

2 Test Specifications & Standards

USCAR 2-5:5.4.1, 5.4.3, 5.4.5

3 Test Sample Information

The following product model numbers are being validated through testing or analysis:

Part Number	Description
0638551-1	CONTACT,FEMALE,0.6MM,SM18-20
2098971-1	36Way socket
2098972-1	18Way socket
2098973-1	20Way socket
2098974-1	10Way socket
2138162-2	84P Header
2209651-1	30P Cover Assy
2209651-2	30P Cover Assy
2209652-1	54P Cover Assy
2209652-2	54P Cover Assy



Fig.1 test sample picture

4 Test Machine List

Equipment Name	Model No.	Lab Equipment No.	Calibration Date
Load Cell	SLBL-1KN	LAB-E021	5/23/2014
Temperature & Humidity Chamber	Espec PL-1KPH	LAB-E024	9/28/2013

5 Notes

- the 54P Header only 15 pins
- the 30P Header only 21 pins

6 Test Description

6.1 Connector Insertion/Extraction Force

6.1.1 Terminal - Connector Insertion Force

Test method: Apply axial load to terminal. test speed = 50 mm / min

Requirements: $F < 30N$

Test Specifications: USCAR2-5 5.4.1

30P Test data:

Sample	Mold	Max	Ave	Min
1-1	A1	3.8	2.6	1.8
1-2	A2	4.8	3.0	1.4
1-3	A1	4.2	2.3	1.5
Max		4.8		
Ave		2.6		
Min		1.4		

54P Test data:

Sample	Mold	Max	Ave	Min
1-1	A1	4.4	2.6	1.6
1-2	A2	4.5	2.8	1.5
1-3	A1	4.4	2.3	1.0
Max		4.5		
Ave		2.6		
Min		1.0		

Test Result: **PASS**

6.1.2 Terminal - Connector Extraction Force

Test Method: Apply axial load to terminal, tested primary and second lock retention force after 40°C 95%-98% humidity 6 hours.

test speed = 50 mm / min

Requirements: F>60N

Test Specifications: USCAR2-5 5.4.1

Test setup and data:

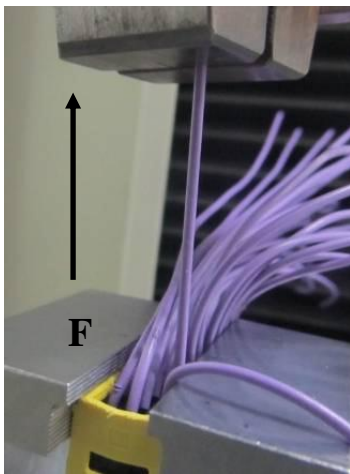


Fig.1 test setup

	30P	54P
Max	124.8	122.4
Ave	112.6	102.6
Min	78.5	84.8

Test Result: PASS

6.2 Connector to Connector Mating/ Un-mating Forces


6.2.1 Engage to pre-lock

Test method: connector engaged to full pre-lock position, connector without pairing terminal. test speed = 50mm/min

Requirements: $F < 75N$

Test Specifications: USCAR2-5 5.4.3.A.1

Test setup and data:

	No	Mold	30P F(N)	54P F(N)	
	2-1	2.1	16.4	14.4	
	2-2	2.1	20.5	28.6	
	2-3	2.1	20.5	13.0	
	2-4	2.1	18.8	31.4	
	2-5	2.1	19.8	30.9	
	2-6	2.2	18.3	28.4	
	2-7	2.2	27.7	13.8	
	2-8	2.2	27.5	12.9	
	2-9	2.2	16.0	13.7	
	2-10	2.2	12.3	37.7	
	Max			27.7	37.7
	Ave			19.8	22.5
Min			12.3	12.9	

Test Result: **PASS**


6.2.2 Disengage to pre-lock

Test method: connector disengaged from full pre-lock position, connector without pairing terminal. test speed = 50mm/min

Requirements: $15N < F < 75N$

Test Specifications: USCAR2-5 5.4.3.A.2

Test setup and data:

	No	Mold	30P F(N)	54P F(N)	
	2-1	2.1	33.4	31.6	
	2-2	2.1	35.1	26.3	
	2-3	2.1	26.5	25.8	
	2-4	2.1	36.4	34.3	
	2-5	2.1	25.7	32.5	
	2-6	2.2	35.2	19.7	
	2-7	2.2	21.9	32.9	
	2-8	2.2	20.5	23.4	
	2-9	2.2	18.0	27.2	
	2-10	2.2	38.0	25.1	
	Max			38.0	34.3
	Ave			29.1	27.9
Min			18.0	19.7	

Test Result: 30P: **PASS** 54P: **PASS**

6.2.3 Move Lever from ship position

Test method: lever from shipping (open) position to full engaged position, without counterpart. test speed = 50mm/min

Requirements: $F > 50N$

Test Specifications: USCAR2-5 5.4.3.B

Test setup and data:

No	Mold	30P F(N)	54P F(N)
2-11	2.1	68.9	72.9
2-12	2.1	66.7	76.3
2-13	2.1	60.1	75.0
2-14	2.1	55.0	59.3
2-15	2.1	50.9	59.7
2-16	2.2	59.2	66.7
2-17	2.2	61.1	54.2
2-18	2.2	51.3	69.9
2-19	2.2	51.9	81.1
2-20	2.2	67.3	75.9
Max		68.9	81.1
Ave		59.2	69.1
Min		51.3	54.2

Test Result: **PASS**

6.2.4 Mating force

Test method: lever from disengaged position to full engaged position, connector fully loaded with terminals. test speed=50mm/min

Requirements: $F < 75N$

Test Specifications: USCAR2-5 5.4.3.C.1

Test setup and data:

No	Mold	30P F(N)	54P F(N)
2-21	2.1	11.3	9.0
2-22	2.1	10.4	10.2
2-23	2.1	11.4	10.3
2-24	2.1	10.3	10.3
2-25	2.1	11.8	9.4
2-26	2.2	11.8	10.9
2-27	2.2	12.1	11.4
2-28	2.2	12.2	10.8
2-29	2.2	10.4	9.7
2-30	2.2	11.2	11.7
Max		12.2	11.7
Ave		11.3	10.4
Min		10.3	9.0

Test Result: **PASS**

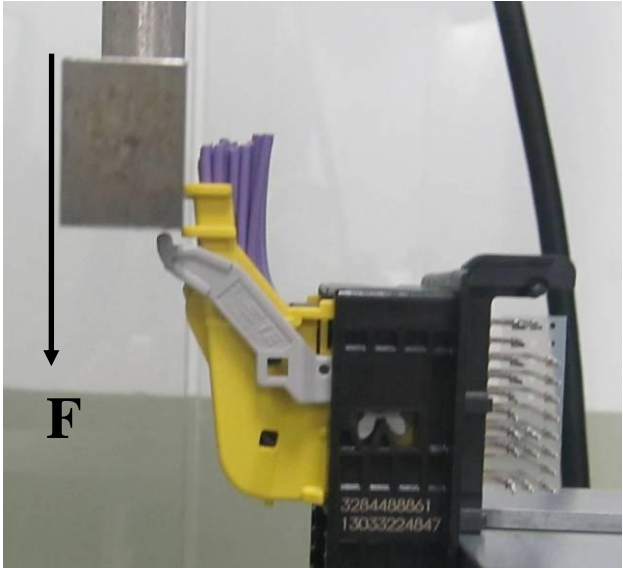
6.2.5 Un-mating Force latch engaged

Test method: lever from full engaged position to disengaged position with release mechanism enabled, connector fully loaded with terminals. test speed=50 mm/min

Requirements: $F > 110N$

Test Specifications: USCAR2-5 5.4.3.C.2

Test setup and data:

	No	Mold	30P F(N)	54P F(N)	
	2-21	2.1	194.0	222.8	
	2-22	2.1	191.3	247.9	
	2-23	2.1	187.7	236.9	
	2-24	2.1	193.8	232.6	
	2-25	2.1	188.2	235.7	
	2-26	2.2	188.9	243.3	
	2-27	2.2	188.9	226.8	
	2-28	2.2	189.2	225.0	
	2-29	2.2	190.1	230.7	
	2-30	2.2	189.7	227.5	
	Max			194.0	247.9
	Ave			190.2	232.9
Min			187.7	222.8	



*Comments: all lock hook of covers are broken

Test Result: **PASS**

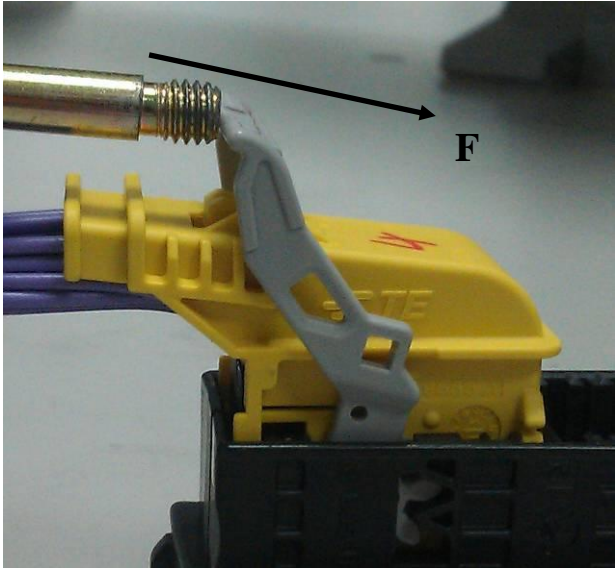
6.2.6 Un-mating Force latch disengaged

Test method: lever from full engaged position to disengaged position with release mechanism disabled, connector fully loaded with terminals. test speed=50 mm/min

Requirements: F<75N

Test Specifications: USCAR2-5 5.4.3.C.3

Test setup and data:

	No	Mold	30P F(N)	54P F(N)	
	2-21	2.1	6.4	5.1	
	2-22	2.1	6.7	5.1	
	2-23	2.1	7.5	6.4	
	2-24	2.1	7.1	5.4	
	2-25	2.1	6.2	7.0	
	2-26	2.2	7.2	6.0	
	2-27	2.2	6.6	6.1	
	2-28	2.2	7.1	6.2	
	2-29	2.2	6.7	5.0	
	2-30	2.2	7.1	6.2	
	Max			7.5	7.0
	Ave			7.0	5.9
Min			6.2	5.0	

Test Result: PASS

6.3 Miscellaneous Component Engage/Disengage Force


6.3.1 Insertion of Socket

Test method: connector fully loaded with terminals, apply axial load to socket. test speed = 50mm/min

Requirements: $F < 60N$

Test Specifications: USCAR2-5 5.4.5

Test setup and data:

	No	Mold	30P F(N)	54P F(N)	
	2-31	2.1	12.7	22.6	
	2-32	2.1	13.9	24.7	
	2-33	2.1	11.9	22.7	
	2-34	2.1	11.8	23.7	
	2-35	2.1	27.9	23.6	
	2-36	2.2	16.7	25.2	
	2-37	2.2	17.2	14.0	
	2-38	2.2	12.7	21.6	
	2-39	2.2	22.2	12.6	
	2-40	2.2	23.8	16.7	
	Max			27.9	25.2
	Ave			17.1	20.7
	Min			11.8	12.6

Test Result: **PASS**

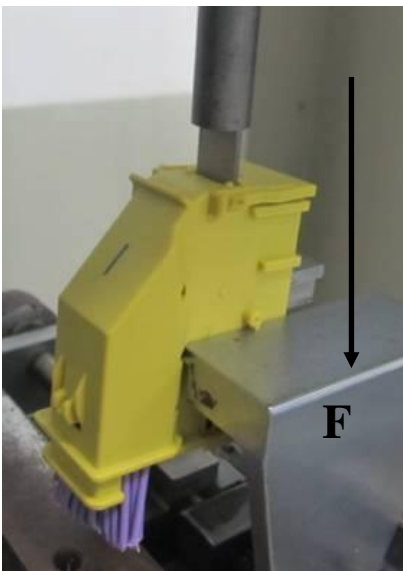
6.3.2 Removal of Socket

Test method: connector fully loaded with terminals, apply axial load to socket. test speed = 50mm/min

Requirements: $F > 110N$

Test Specifications: USCAR2-5 5.4.5

Test setup and data:

	No	Mold	30P F(N)	54P F(N)	
	2-31	2.1	145.1	179.3	
	2-32	2.1	185.2	137.3	
	2-33	2.1	174.6	130.2	
	2-34	2.1	115.4	189.0	
	2-35	2.1	137.1	179.0	
	2-36	2.2	123.4	168.4	
	2-37	2.2	119.1	124.2	
	2-38	2.2	110.5	110.3	
	2-39	2.2	115.5	174.9	
	2-40	2.2	166.3	189.4	
	Max			185.2	189.4
	Ave			139.2	158.1
	Min			110.5	110.3

Test Result: **PASS**