DEUTSCH* DRBM-3X Interface Flange Validation

1. INTRODUCTION

1.1. Purpose

Testing was performed on DEUTSCH DRBM-3X Interface Flange to determine conformance to mechanical tests and IPX5. Test procedures are given in customer specific specifications.

1.2. Scope

This report covers the environmental sealing performance of the DRBM-3X interface flange. Testing was performed at the Hemet Product Test Laboratory in 2013. The test file numbers for this testing are listed in Figure 1. This documentation is on file at, and available from Product Engineering, Industrial Commercial Transportation (ICT) Laboratory.

Test Group	Test Report
1	131008-02
2	131021-01
3	131021-02

Figure 1

1.3. Conclusion

The DEUTSCH DRBM-3X conformed to the mechanical and environmental sealing performance requirements for IPX5 when tested per the sequences shown in Figure 3 of this document.

1.4. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the part numbers given in Figure 2 were used for testing.

DEUTSCH PART NUMBER	DESCRIPTION	TEST GROUP
DRBM-3A	Interface Flange for DRB102/128pin	1,2,3
DRB12-128SAE-L018	128pin Receptacle	3
DRB16-128SAE-L018	128pin Plug	3
0413-214-1205	Size 12 Sealing Keying Pin	3
0413-215-1605	Size 16 Sealing Keying Pin	3

Figure 2

1.5. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15° to 35°C
Relative humidity: 25 to 75%

1.6. Qualification Test Sequences

TEST OR EXAMINATION	TEST GROUP (a)		
	1	2	3
	TEST SEQUENCE (b)		
Visual Examination	1,3	1,4	1,3
Thermal Cycle		2	
Torque to Failure	2		
Torque Relaxation		3	
Protection Against Low Pressure Water Jet (IPX5)			2

(a) Specimens were prepared in accordance production drawings and were selected at random from current production.

- Groups 1-2 specimens consisted of interface flange only.
- Groups 3 specimens consisted of interface flange and 128 position connectors with sealing keying pins in all contact cavities.

(b) Numbers indicate sequence that tests were performed.

Figure 3

2. SUMMARY OF TESTING

2.1. Visual Examination (Groups 1-3)

A. Procedure: SAE J2030

B. Method: The visual examination should be performed prior to testing, noting in detail any manufacturing or material defects such as cracks, tarnishing, deformities, etc.

C. Requirement: No physical defects detrimental to product performance.

D. Result: **PASSED.**

2.2. Thermal Cycle (Group 2)

A. Procedure: DITS 7-303-01

B. Method: Cycle mated connectors from –55 ± 3 °C to +125 ±3 °C at a rate of 3 °C ± 1°C per minute. Connectors to remain at each temperature extreme for 1 hour minimum. Mated connectors are to be cycled a total of 20 complete cycles.

C. Requirement: There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test.

D. Result: **PASSED.**

2.3. Torque to Failure (Group 1)

A. Procedure: Not Applicable

B. Method: Assemble interface flanges without M8 and M10 nuts. Next install M8 nut onto M8 power stud and torque until nut stripped or plastic tower cracked. Record failure torque. Repeat using M10 nut on M10 power stud.

C. Requirement: Record torque to failure

D. Result: M8 nut had thread failure at 200 in-lbf. M10 nut cracked the flange at 300 in-lbf

2.4. Torque Relaxation (Group 2)

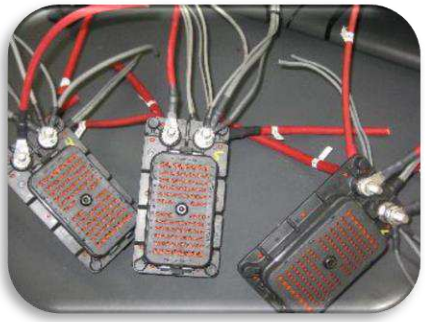
E. Procedure: Not Applicable

F. Method: Install customer provided pre-assembled cable and mounting hardware. Torque hardware onto the studs to 10.5 NM. Remove the nut while measuring the torque value. Record values. Perform thermal cycle test. Remove the nut while measuring the torque value. Record values. and inspect for any evidence of cracking, distortion or detrimental damage to the connector.

G. Requirement: Inspect for any evidence of cracking, distortion or detrimental damage to the flange

H. Result: **PASSED.**

Torque values to remove		Engine Side		Cab Side	
		8 MM BOLT	10 MM BOLT	8 MM BOLT	10 MM BOLT
Before Temp.	Item: 1	8.5	8.5	8	9
	Item: 2	10	7	8.5	10
	Item: 3	8	7	8	9.5
After Temp.	Item: 4	9	7.5	8	12
	Item: 5	9.5	8	9	13
	Item: 6	10	10	10	12.5



2.5. Protection Against Low Pressure Water Jet (IPX5) (Group 3)

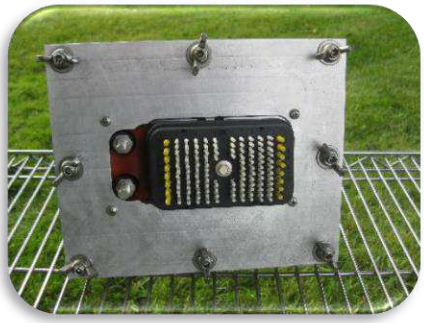
E. Procedure: DIN 40050, Part 9

F. Method: Place test sample inside an enclosure. Spray the enclosure using a water jet with 6.3mm nozzle. Water volume: 12.5 lpm; pressure: 30kPa, distance: 3 meters, test duration: ≥ 3 minutes.

a. Test deviation: Used 1800 psi high pressure spray

G. Requirement: No water inside of enclosure

H. Result: **PASSED.**




3.1 Revision History

Rev Ltr	Brief Description of Change	Date	Dwn	Apvd
A	Initial Release	18-Oct-2019	DM	DM