DEUTSCH* DRC13-70PX-B027 Series Connector System

1. INTRODUCTION

1.1. Purpose

This report summarizes the results of testing performed on DEUTSCH DRC13-70PX-B027 series connector system to determine conformance to the requirements of product specification 108-151069.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the DEUTSCH DRC13-70PX-B027 series connector system. Testing was performed at the DEUTSCH Industrial Products Division Laboratory in 2005. 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	IPD051107-01
2	IPD051107-02
3	IPD051107-03
4	IPD051107-04

Figure 1

1.3. Conclusion

The DEUTSCH DRC13-70PX-B027 series connector system products listed in Paragraph 1.4 conform to the electrical, mechanical, and environmental performance requirements given in product specification 108-151069.

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
DRC13-70PC-B027	70pin Header Receptacle, 90°	1,3,4
DRC13-70PD-B027	70pin Header Receptacle, 90°	2,3,4
DRC16-70SC-P013	70pin Plug	1
DRC16-70SD-P013	70pin Plug	2
1062-16-0122	Size 16 S&F Socket, Nickel	1,2

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%

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1.6. Qualification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)			
	1	2	3	4
	TEST SEQUENCE (b)			
Examination of Product	1,15	1,13	1,4	1,3
Insulation Resistance	2			
Dielectric Withstanding Voltage	3			
Low Level Contact Resistance	4,7,10,13	2,5,8,11		
Contact Resistance	5,8,11,14	3,6,9,12		
Durability	9			
Vibration		7		
Pin Retention			3	
Center Threaded Insert Stripping Torque				2
Temperature Life	6			
Thermal Cycle		4	2	
Water Immersion	12	10		

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

- Groups 1-2 specimens consisted of 70-position connectors with DEUTSCH stamped and formed terminal system size 16 nickel sockets with 16 AWG wire.
- Groups 3-4 specimens consisted of 70-position connectors without terminals.

(b) Numbers indicate sequence that tests were performed.

Figure 3

2. TEST METHODS AND RESULTS

2.1. Examination of Product (Groups 1-4)

A. Procedure: DITS 7-303-01

B. Method: Conduct a visual examination for identification of product, torn seals, cracked plastic, etc.

C. Requirement: Free of defects that could affect the electrical or mechanical performance of the part or degrade the long term performance of the part.

D. Result: **PASSED.**

2.2. Insulation Resistance (Group 1)

A. Procedure: DITS 7-303-01

B. Method: Check each contact to all other contacts and the shell, if shell is conductive. Test to be performed using a 500 VDC ±10% Megohmmeter.

C. Requirement: ≥ 1000 MΩ

D. Result: **PASSED.**

2.3. Dielectric Withstanding Voltage (Group 1)

A. Procedure: DITS 7-303-01

B. Method: Check each contact to all other contacts and the shell, if the shell is conductive, for 1 minute minimum. Test to be performed at 1500 VAC ±10%.

C. Requirement: Current leakage not to exceed 2.0 mA for mated connectors

D. Result: **PASSED.**

2.4. Low Level Contact Resistance (Groups 1,2)

A. Procedure: DITS 7-303-01

B. Method: Test with applied voltage not to exceed 20 mV open circuit and the test current shall be limited to 100 mA. The resistance of an equal length of wire (reference wire) shall be subtracted from the same reel as used for the connector wiring.

C. Requirement: ≤ 6 mΩ

D. Result: **PASSED.**

2.5. Contact Resistance (Groups 1,2)

A. Procedure: DITS 7-303-01

B. Method: Test using 13A test current. The resistance of an equal length wire (reference wire) shall be subtracted from the actual readings to determine the added resistance of the terminal. The reference wire shall be from the same reel as used for the connector wiring.

C. Requirement: ≤ 100 mV

D. Result: **PASSED.**

2.6. Durability (Group 1)

A. Procedure: DITS 7-303-01

B. Method: The connector shall be mated and unmated for a total of 100 complete cycles at room temperature. If a connector retaining bolt is utilized, retorque to the recommended torque after each cycle.

C. Requirement: No evidence of damage to the contacts, contact plating, connector housing or seals which may be detrimental to reliable connector performance.

D. Result: **PASSED.**

2.7. Vibration (Groups 2)

A. Procedure: DITS 7-303-01

B. Method:

- Sine Sweep: 10 to 2000 Hz
- Initial Displacement: .07 inch DA
- Max Acceleration: 20 G's
- Test Duration: 12 hours
- Time Per Axis X, Y, Z: 4 hours
- Test Current: 10A first 3 hours each axis

C. Requirement: There shall be no discontinuity greater than 1 µs at 20mV and 100 mA during the last hour of each axis.

D. Result: **PASSED.**

2.8. Pin Retention (Group 3)

A. Procedure: Not Applicable

B. Method: Apply a direct axial load at a rate of 1.00 inch per minute until the header pin is pushed out of the housing.

C. Requirement: ≥ 25 lbf pushout

D. Result: **PASSED.**

2.9. Center Threaded Insert Stripping Torque (Group 4)

A. Procedure: Not Applicable

B. Method: Apply a 50 in-lb. torque to the plug center jackscrew. Inspect the receptacle center threaded insert and area around for evidence of cracking or crazing around or stripping of threads within the threaded insert.

C. Requirement: No signs of damage

D. Result: **PASSED.**

2.10. Temperature Life (Group 1)

A. Procedure: DITS 7-303-01

B. Method: The wired mated connectors shall be subjected to 1000 hours at +125 ±3 °C without current flowing.

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

D. Result: **PASSED.**

2.11. Thermal Cycle (Groups 2,3)

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.**

2.12. Water Immersion (Groups 1,2)

A. Procedure: DITS 7-303-01

B. Method: The wired mated connectors shall be placed in an oven at +125 ±3 °C 2 hours minimum then immediately be placed in water with a 5% slat by weight content and 0.1 g/L wetting solution to a depth of 3 feet 4 hours minimum. The free ends of the mated connectors must remain out of the water to prevent wicking of the water through the open wires. Water temperature to be +23 ±3 °C.

C. Requirement: Test samples must meet insulation resistance.

D. Result: **PASSED.**

3. REVISION HISTORY

Rev Ltr	Brief Description of Change	Date	Dwn	Apvd
A	Initial Release	11-Oct-2019	DM	DM