

DLA L&M, in an effort to make sure all affected parties have access to this information, requested and obtained Amphenol Aerospace's permission on 09 May to post the following on our public website. Since this data was excerpted from GIDEP document NX4-P-09, we also requested and obtained the GIDEP Program Manager's permission to take this special and urgent action in accordance with GIDEP Distribution Policy.

1. TITLE (Class, Function, Type, etc.)

MIL-DTL-83723 Retention Testing

2. DOCUMENT NUMBER

NX4-P-16-07

3. DATE (DD-MMM-YY)

11-APR-16

4. MANUFACTURER AND ADDRESS

Amphenol Aerospace  
40-60 Delaware Ave  
Sidney, NY 13838

5. PART NUMBER

Not Available

6. NATIONAL STOCK NUMBER

Not Available

7. SPECIFICATION

MIL-DTL-83723

8. GOVERNMENT PART NUMBER

M83723/XX

9. LOT DATE CODE START

0741

10. LOT DATE CODE END

0940

11. MANUFACTURER'S POINT OF CONTACT

Ron Williams

12. CAGE

49367 / 14283

13. MANUFACTURER'S FAX

Not Available

14. MFR. POC PHONE

(607) 563-5344

15. MANUFACTURER'S E-MAIL

rwilliams@amphenol-aao.com

16. SUPPLIER - Not Applicable

17. SUPPLIER ADDRESS - Not Applicable

18. SUPPLIER CAGE - Not Applicable

19. PROBLEM DESCRIPTION / DISCUSSION / EFFECT

Amphenol Aerospace (AAO) is currently delinquent on MIL-DTL-83723 group C retention testing. AAO manufactures MIL-DTL-83723 product under 2 unique designs identified as Pyle (cage code 49367) and Matrix (cage code 14283). AAO observed test failures for the following:

- Cavity-to-Cavity Leakage: requirements para. (3.5.37), test method para. (4.6.39)
- DWV at altitude - low temperature: requirements para. (3.5.6), test method para. (4.6.6)

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20. ACTION TAKEN/PLANNED

DLA imposed a stop production and stop shipment on AAO relative to the subject MIL-Spec product for delinquent retention testing. In addition, DLA requested that AAO disclose an analysis of failures observed during current testing period. Upon resolution of open actions with DLA and the lifting of their imposed stop shipment/production order, AAO plans to resume production and shipment of the subject connectors.

21. DATE MFR. NOTIFIED/  
SUPPLIER NOTIFIED - Not  
Applicable

22. MFR./SUPPLIER RESPONSE -  
Not Applicable

REPLY ATTACHED

NO REPLY

23. ORIGINATOR ADDRESS/POINT OF CONTACT

Ron Williams, Amphenol Aerospace  
191 Delaware Ave  
Sidney, NY 13838-1304  
rwilliams@amphenol-aao.com (607) 563-5344

24. GIDEP REPRESENTATIVE

Kyle Christoffersen

25. SIGNATURE

Signature on File

26. DATE

11-APR-16

## **Block 19 Continued:**

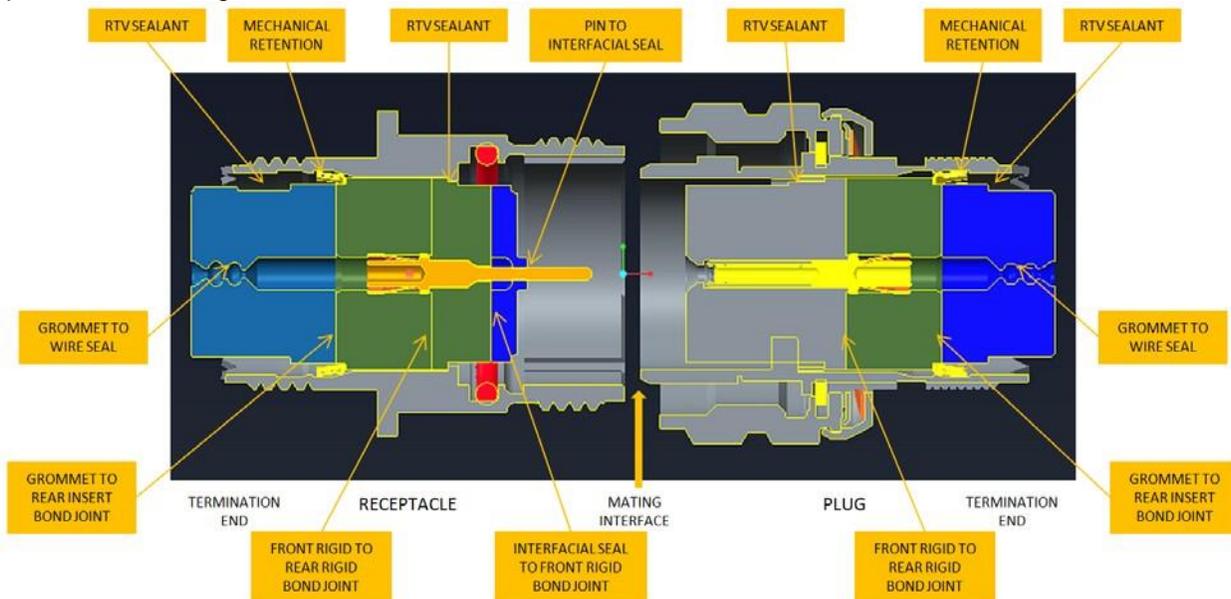
### **Discussion of Test Failures:**

#### **Cavity-to-Cavity Leakage**

The most logical potential failure mode on a connector that fails cavity-to-cavity leakage is for a fluid to migrate into the cavity-to-cavity leakage path, which could reduce insulation resistance between adjacent contacts. This ability of a fluid to migrate into a cavity-to-cavity leakage path is not an easy one, as there are a number of sealing features that prevent the ingress of fluid into the contact cavities in both the mated and unmated state of the connectors, including:

1. (3) sealing webs within each grommet cavity
2. RTV (grommet to shell)
3. RTV (insert to shell)
4. Main joint o-ring seal
5. Interfacial seal tower

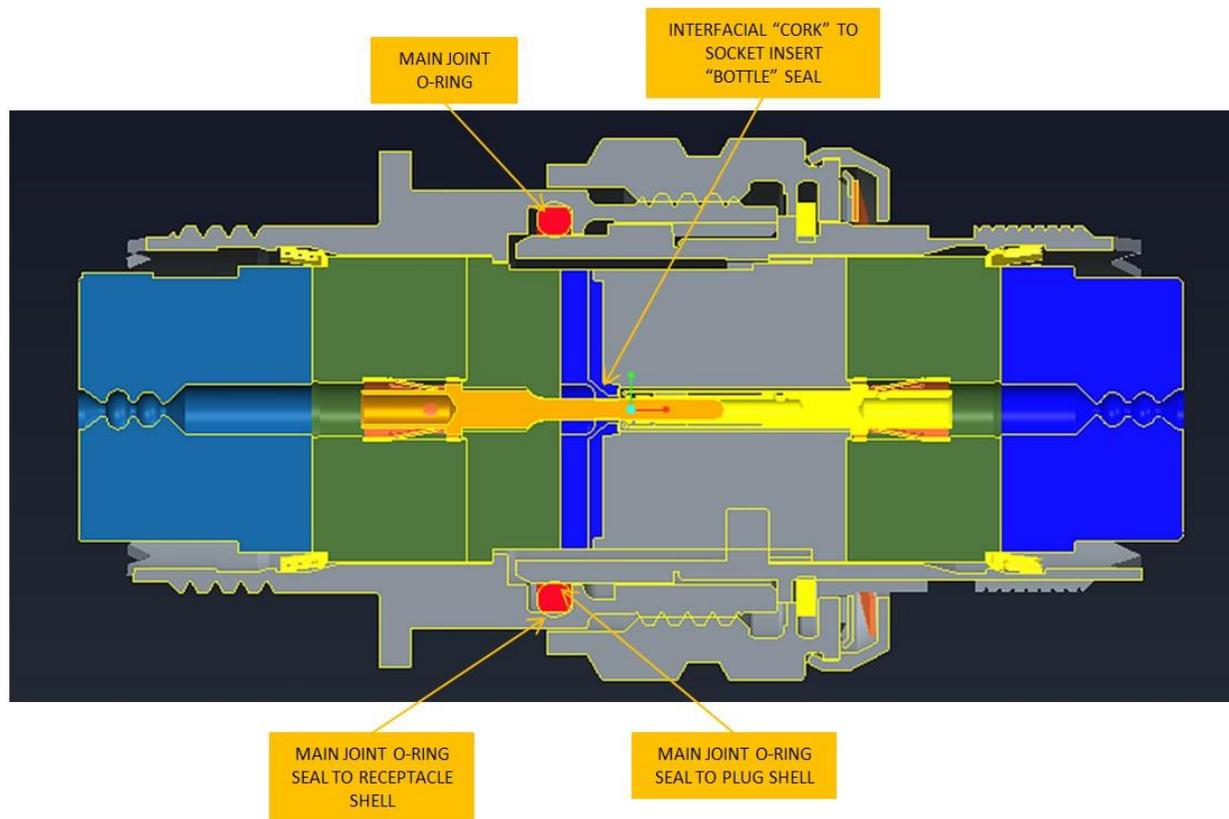
From the termination end of a connector, the interior of the contact cavities are protected by 3 sealing webs in each contact cavity of the rear silicone grommet. As long as the minimum diameter specified by the MIL-DTL-83723 spec is met by the wire, PC tail, and/or the sealing plug, there will be no leakage path. In addition, an RTV sealant is applied between the grommet and the inside of the shell.



From the mating face of the connectors, an RTV sealant is applied at the forward stop shoulder of the front insert and the shell. On the pin insert connectors, the pins interfere with the towers of the interfacial seal, sealing each individual cavity.

For a fluid to ingress to a cavity-to-cavity leakage path when the connectors are unmated, the only vulnerability to access of the contact cavities would be at the mating face of the socket contact cavities.

In the mated condition, there are two sealing elements that engage to further protect the individual contact cavities. First is the main joint o-ring seal, which is compressed between the outside diameter of the plug and inside diameter of the receptacle shells. In parallel to the main joint o-ring seal, the towers on the interfacial seal on the pin side seal into the rigid chamfered main interface of the socket insert, creating a “cork and bottle” seal.



For a fluid to ingress to a cavity-to-cavity leakage path of a pair of mated connectors, the numerous previously mentioned seals would have to be defeated.

Per group A testing requirements outlined in MIL-DTL-83723, AAO performs Insulation Resistance (IR) and Dielectric Withstanding Voltage (DWV) testing on 100% of production assemblies.

Based on the numerous seals provided by the 83723 connector design, 100% electrical testing of all contact cavities, and zero known field failures attributed to cavity-to-cavity leakage, AAO believes there to be an extremely low risk of an electrical failure when using connectors exhibiting this condition.

To verify minimal risk of electrical failure in product exhibiting this condition, AAO conducted IR and DWV electrical testing after the following conditioning:

- 1) Connectors were immersed in the mated condition
- 2) Connectors were immersed in the unmated condition

The results of both tests were excellent.

For the connectors that were fully mated and immersed in water, (M83723/71R2212N and M83723/76R2212N), the IR and DWV performance was unchanged, as expected (IR was greater than the 5 GΩ requirement for a dry connector at 500 VDC, and no DWV issues at 1500 VAC), proving that the multiple seals served their functional purpose. The cavity to cavity leakage performance was confirmed after this test, and the socket connector had seven of twelve leaking cavities.

Two additional, fully wired connectors were totally immersed in water in the unmated state (M83723/85R1404N and M83723/86R1404N), shaken off, and then fully mated. The IR met the 100 MΩ post-humidity requirements at 500 VDC, and met the DWV requirement at 1500 VDC. The cavity-to-cavity leakage performance was confirmed after this test, and the socket connector had three of four leaking cavities.

## DWV at altitude – low temperature

Insulation Resistance (IR) and Dielectric Withstanding Voltage (DWV) is tested on 100% of product at a sub-assembly level under group A testing requirements. During group C testing AAO observed 1 connector failure at the DWV at low temperature altitude. This connector was observed with damage between the adjacent cavities that failed group C electrical test. AAO determined this failure is a one-time occurrence most-likely caused during prior test setup procedures. The failure was 1 connector out of the 16 tested per group C and it passed group A electrical testing at the sub-assembly level.

Risk Assessment:

- Isolated occurrence (1 connector failure of 16 tested)
- Compliant (IR) performance at 500 VDC remaining greater than 50 GΩ prior to DWV test
- 100% Group A conformance inspections performed

Given these facts, AAO believes there to be extremely low risk for any product in the field.