

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

SURVIVAL FACTORS GROUP INFLATION VALVE TEARDOWN REPORT

August 8, 2018

I. ACCIDENT

Operator	:	Caribbean Sun Airlines dba World Atlantic Airlines
Aircraft	:	MD-83 [N807WA]
Location	:	Alexandria, LA
Date	:	April 20, 2018
Time	:	1420 (CDT) ¹
NTSB #	:	DCA18FA144

II. SURVIVAL FACTORS GROUP²

Group Chairman	:	Peter Wentz National Transportation Safety Board Washington, DC
Member	:	Mike Kret Air Cruisers Company Wall Township, NJ
Member	:	Paul Lacy Air Cruisers Company Wall Township, NJ
Member	:	Bob Huff Boeing Company Seal Beach, CA
Member	:	Joseph Macay FAA Saddle Brook, NJ

¹ All times in this report are central daylight time, based on a 24-hour clock.

² Not all group members were present for all activities.

III. SUMMARY

This is a continuation of the investigation regarding the incident of April 20, 2018 involving an MD-83, registration N807WA, operating as Caribbean Sun Airlines dba World Atlantic Airlines flight RPM708, at Alexandria Airport (AEX), Alexandria, Louisiana. Members of the Survival Factors Group met at Air Cruisers Company in Wall Township, NJ on August 8, 2018 to conduct a teardown of the inflation valve from the World Atlantic event.

IV. DETAILS OF THE INFLATION VALVE TEARDOWN

1. The reservoir and inflation valve assembly was removed from quarantine for inspection. The valve part number was confirmed to be D18294-107 with serial number B490-6100.
2. The pressure gage reading is shown in Photograph 1.



Photograph 1 – Current Gage Indication.

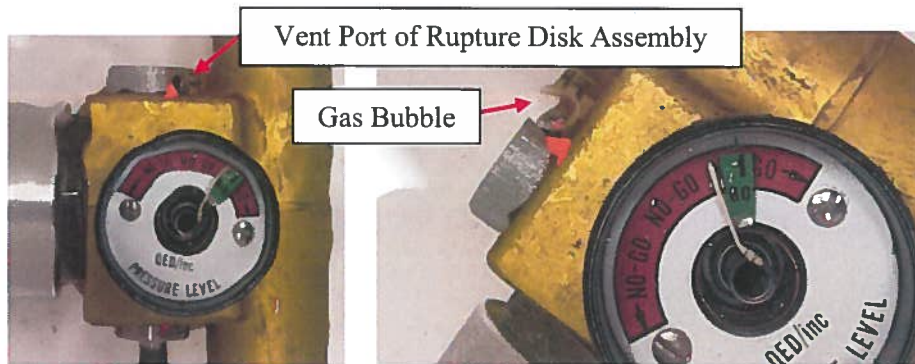
3. The reservoir and valve assembly was then weighed, with a total weight reading of 6.125 lbs. as shown in Photograph 2. The weight lost to date via leakage was 0.875 lbs. (The reservoir and valve assembly weighed 7.0 lbs. total on 4 May 2018).



Photograph 2 – Reservoir and Valve Assembly Weight.

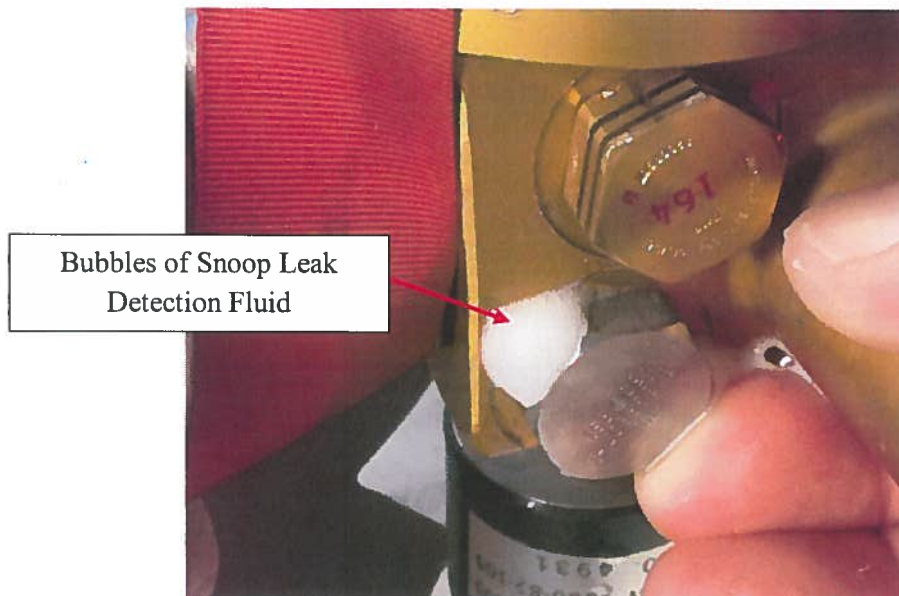
4. Subsequent to the investigation performed on 3 May 2018, the reservoir and valve assembly was submerged in an alcohol bath to confirm the origin of the gas leakage. This test revealed a periodic release of a gas bubble emanating from the Rupture Disk Assembly,

as shown in Photograph 3. No other locations of gas leakage were noted during this dunk test, including the valve outlet as previously identified during the May teardown. Consequently, this follow up investigation concentrated on the Rupture Disk Assembly.



Photograph 3 – Gas Leakage From Rupture Disk Assembly.

5. This investigation began by filling the outlet ports of the Rupture Disk Assembly with Snoop leak detection fluid. Evidence of continued leakage thru these ports was immediately apparent as shown in Photograph 4.



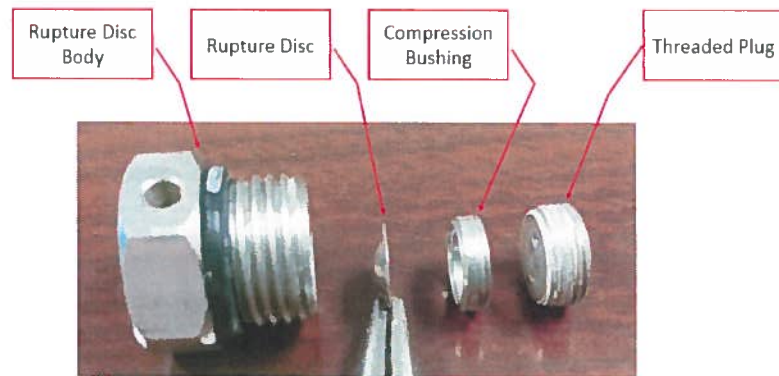
Photograph 4 – Snoop on Rupture Disk Discharge Port.

6. The reservoir was discharged thru the filler valve port. The Rupture Disk Assembly was then removed from the inflation valve body. The Rupture Disk Assembly had no obvious signs of damage or corrosion as shown in Photograph 5. The Rupture Disk Assembly was identified as “GPC 826GPS07-1 4500 psi”.

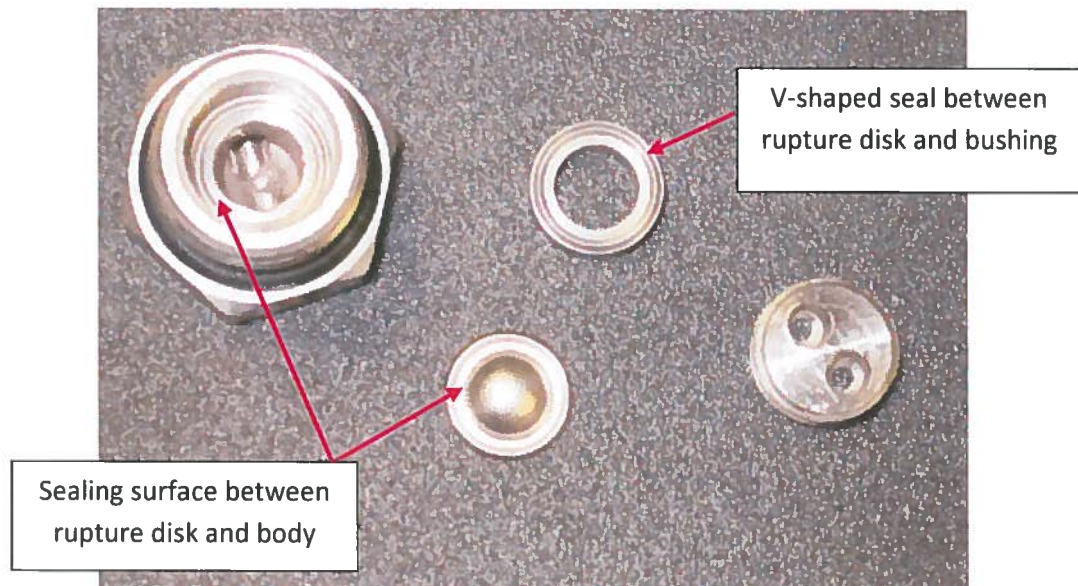


Photograph 5 – Rupture Disk Assembly.

7. An exploded view of the Rupture Disk Assembly is shown in Photograph 6. The interior rupture disk seats against the body of the Assembly by a compression bushing, which is secured using a threaded plug. The rupture disk is securely held against the compression bushing by a matching V-shaped edge around both components. This V-shaped edge maintains the pressure seal and limits movement of the rupture disk within the Assembly. The key sealing surfaces are shown in Photograph 7.



Photograph 6 – Rupture Disk Assembly Exploded View.



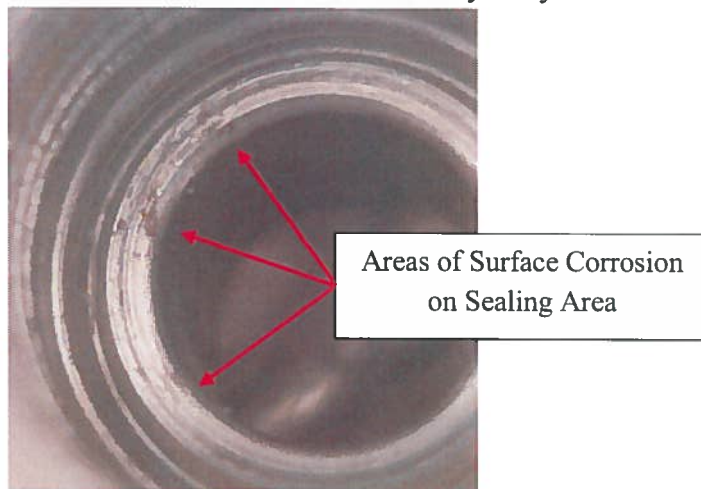
Photograph 7 – Rupture Disk Assembly Components.

8. The threaded plug was carefully loosened and removed to gain access to the interior of the Assembly. The plug was adequately secured in place and appeared to be undamaged upon removal. The removal torque could not be measured due to a requirement for special tooling.
9. Once the threaded plug was removed, the rupture disk was visible and intact as shown in Photograph 8. There was no evidence of cracks or other defects. The debris shown in the Photograph is consistent with previously applied thread sealant.



Photograph 8 – Rupture Disk Assembly.

10. The compression bushing and the rupture disk were carefully removed for further inspection. No evidence of damage or corrosion was found around the edges of the rupture disk or on the compression bushing.
11. Inspection of the interior rim inside the body of the rupture disk assembly found three small areas of surface corrosion, shown in Photograph 9. These areas are located on the sealing surface where the rupture disk makes contact with the assembly body.



Photograph 9– Minor Surface Corrosion.