

## **PFR-041** Title: Spring spool in SCB base hinge loosened by vibration

Assembly : Mag Booms		SubAssembly : SCB	
Component : Spri	ng spool		
Originator: T Tan		Organization: Space Sciences Lab	
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<b>Failure Occurred</b> I	During (Check one √) ☑ Qualification test	□ S/C Integration	□ Launch operations
Environment when Ambient Thermal	<b>failure occurred:</b> ☑ Vibration □ Vacuum	□ Shock □ Thermal-Vacuum	□ Acoustic □ EMI/EMC

## **Problem Description**

(In this section it is important to document the specific symptoms which exhibited the problem. In the event we see it happen again, we would like to know as much as possible.)

After completing vibration qualification of the SCB on 3/25/05, the booms were put in thermal vacuum testing on 3/29/05 - 4/1/05. During the hot deploy phase (50C), it was discovered that the SCB boom did not deploy. Inspection found that there was a large increase in friction of the base hinge. This was caused by spring spool that holds the energy absorption spring assembly in the base unloosening. The unloosened spring spool had jammed the hinge mechanism against the clevis.

**Analyses Performed to Determine Cause** 

(How do we know how the failure happened? Was it a bad part, bad handling, what?)

The spring spool had loosened in vibration prior to thermal vacuum testing because of insufficient torque used to tighten the spring spool.

## **Corrective Action/ Resolution**

(How do we fix the unit? And how do we make sure it doesn't happen again?)

The qualification test sequence is modified to include a deployment functional test after vibration and before thermal vacuum testing.

The spring spool is modified and a torque fixture was built to tighten the SCB spool to 50 in-lb. A similar fix was also performed on the FGB.

The booms with the tightened spools were tested in vibration on 4/25/05 (T Tan) at qualification levels. The spools did not loosen after vibration.

MAM: Ron Jackson	; MSE: Ellen Taylor
PM: Peter Harvey	; Cognizant Engineer

Date of Closure\_\_\_\_\_

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