# STEREO IMPACT

PROBLEM REPORT
PR-7006
SEPT-Rod
2004-11-23

**PR Numbers: 1xxx=UCB, 2xxx=Caltech/JPL, 3xxx=UMd, 4xxx=GSFC/SEP, 5xxx=GSFC/Mag, 6xxx=CESR, 7xxx=Kiel, 8xxx=ESTEC, 9xxx=MPAe**

| | |
|---|---|
| **Assembly : IMPACT SEPT-NS FM2** | **SubAssembly : Sensor** |
| **Component/Part Number:** pinpuller rod | **Serial Number:** A201 SN4 |
| **Originator:** Reinhold Mueller-Mellin | **Organization:** U. Kiel |
| **Phone :** +49-431-880-227 | **Email :** mueller-mellin@physik.uni-kiel.de |

**Failure Occurred During (Check one √)**

√ Functional test | Qualification test | S/C Integration | Launch operations

**Environment when failure occurred:**

Ambient | √ Vibration | Shock | Acoustic
Thermal | Vacuum | Thermal-Vacuum | EMI/EMC

## Problem Description

On November 23, 2004, SEPT-NS FM2 had finished its vibration tests and a door opening test was carried out. When attempting to open the doors on the rear side (i.e. side A) the pinpuller retracted correctly drawing 0.8 A for 45 ms as expected. However, both doors did not swing open, because the rod was still partly blocking the door clevises (see Fig. 1). Apparently, during vibration, the rod had loosened from the pinpuller pin because the rod was not sufficiently torqued into the pin tip which provides an M2 internal thread. Inspection of side B showed an identical failure, so it was not attempted to open side B (see Fig. 2).

## Analyses Performed to Determine Cause

The M2 thread was not staked prior to vibration for the fear of losing a pinpuller in case of a disassembly later-on for some unexpected reason. As the mechanical specification from the manufacturer TiNi of the torque load was not clear to us ("nominal stress of 50 ksi stress"), the rod was torqued to good engineering practise only. An earlier attempt to apply adhesive on the rod/pin interface on the outside surface was discarded because this interface will move right to the hole drilled into the sensor mounting lug through which the pin is retracting.

## Corrective Action/ Resolution

Rework | √ Repair | Use As Is | Scrap

The pinpuller of side A was re-stowed, the pinpuller rods of sides A and B were re-torqued to good engineering practise, the pinpullers were actuated and the doors opened nominally with expected currents and activation times. Having advanced thus far in the assembly and test program, we felt that it was justified to stake the thread on the pinpuller rods using Araldite 2014 adhesive. It was decided to stake all pinpuller-rods, even those which performed flawlessly after vibration. The SEPT materials list was updated to include Araldite 2014. The four SEPT units proceeded to TV testing with staking applied.

**Date Action Taken**: 23-NOV-04 **Retest Results**: All 16 doors opened flawlessly in TV

**Corrective Action Required on other Units** √ Serial Number(s): A195 SN1, A201 SN2, A195 SN3

## Closure Approvals

| | | |
|---|---|---|
| Subsystem Lead: | Reinhold Mueller-Mellin | Date: 06-DEC-04 |
| IMPACT Project Manager: | _____ | Date:_____ |
| IMPACT QA: | _____ | Date:_____ |
| NASA IMPACT Instrument Manager: | _____ | Date:_____ |

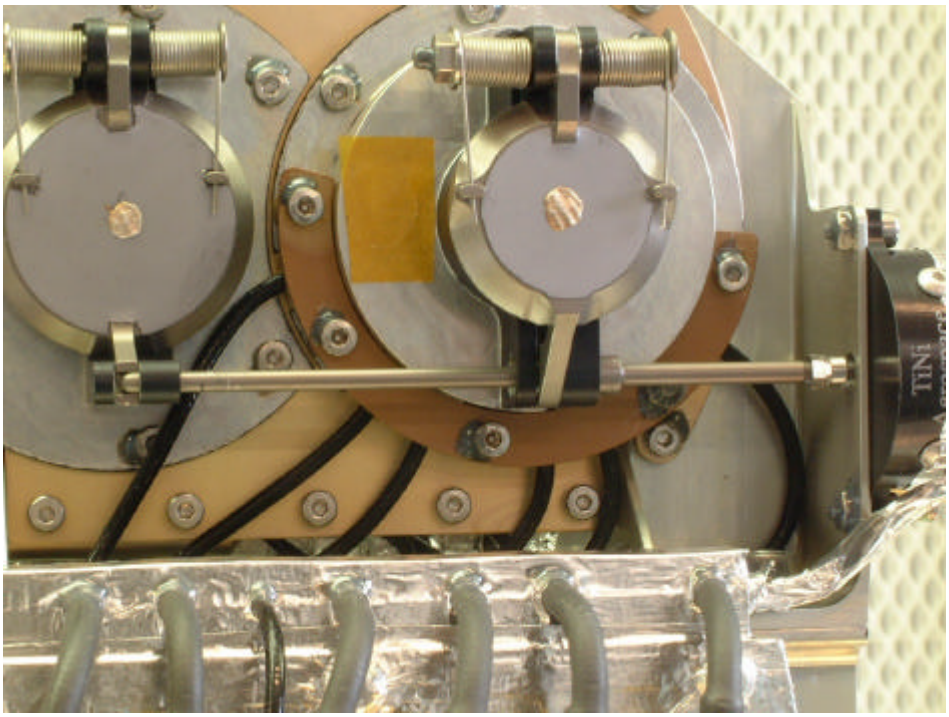

**Figure 1:** **SEPT-NS FM2 side A after pin-puller actuation after vibration**

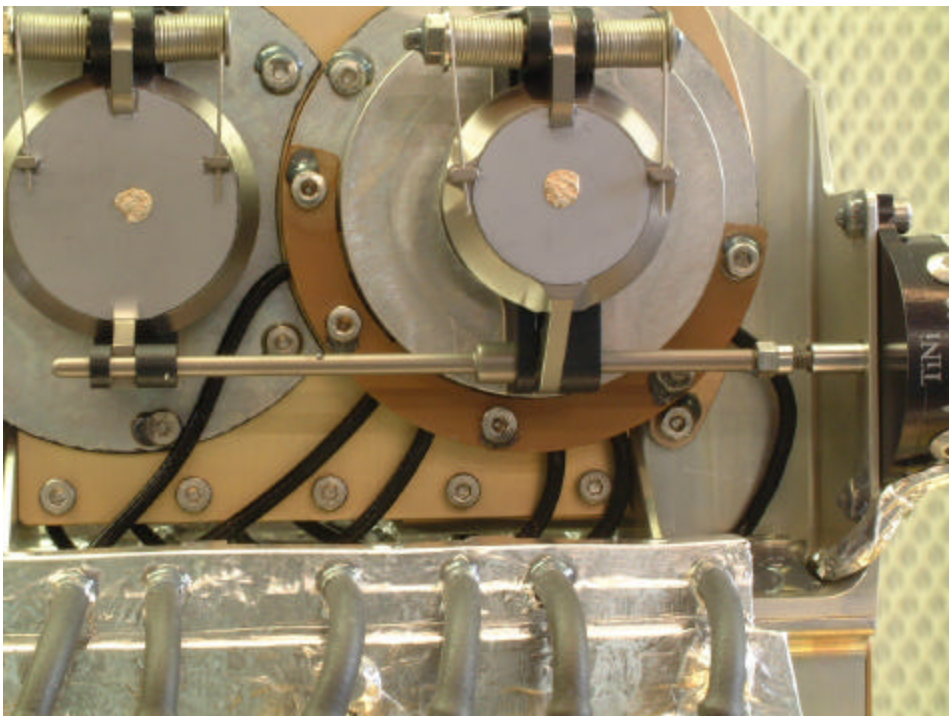

**Figure 2:** **SEPT-NS FM2 side B after vibration, pin-puller actuation not attempted**