

STEREO IMPACT

PROBLEM REPORT
PR-7007
SEPT TB Door test failure
2005-02-11

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

Assembly : SEPT-E (FM2)	SubAssembly : Door
Component/Part Number:	Serial Number: FM2
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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

During the Hot Door Actuation SEPT-E Behind (FM2) rear proton door did not open. The electron door that is opened by the same pinpuller did open. Pinpuller actuation was nominal. Reference STEREO Thermal Balance Test Plan, STEREO-GSFC002.C, p14, Sec. 8. Conditions: 44C (hot soak), Time: 12:12 p.m. , Pressure 4.5 x 10⁻⁷ Torr. (See the next page for a more thorough description.)

Analyses Performed to Determine Cause

The chamber was opened and it was apparent that the MLI was interfering with the door. The MLI was gently pressed and the door immediately opened. Reference photos taken when the chamber was opened.

Corrective Action/ Resolution

Rework Repair Use As Is Scrap

- Document adequate keepout zones (consider eyelet or fastener use) for MLI and perform rework and test the new blanket design during the door opening portion of the Phase 2 thermal balance tests. (SEPT-NS tests). (see attached photos)
 (Update: 3/6/05 During the Phase 2 TB tests SEPT-NS (FM1) blankets were modified with a "new design" and SEPT-NS (FM2) were not. The thermal engineer wanted to compare the thermal impact of the design change. During the Cold door actuation tests one of the SEPT-NS FM2 doors did not open (old design). The door opened when the chamber warmed to ambient after hot operational. After close inspection it appears that the blanket interfered with the door latch.
- FRB held 3/9/2005. Agreed on a two segment approach to the MLI with the one segment of MLI near the apertures permanently attached using transfer adhesive. Implemented changes and reworked all of the SEPT flight blankets.
- Thermal testing successfully repeated on the SEPT-NS units with the new flight blankets. The SEPT-E units and SEPT-NS units will be tested during observatory level thermal testing. All doors will open closed (worst case) except of the one SEPT-E door that is in the sun. That door will be actuated hot.

Date Action Taken: 5/9/2005 **Retest Results:** _____ successful _____

Corrective Action Required/Performed on other Units Serial Number(s): SEPT-E FM1, SEPT-NS FM1 and FM2

Closure Approvals

Subsystem Lead: _____	Date: _____
IMPACT Project Manager: _____	Date: _____
IMPACT QA: _____	Date: _____
NASA IMPACT Instrument Manager: _____	Date: _____

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SEPT Door Opening Test Summary:

February 9, 2005

Ambient Pre Thermal Balance Door Opening Test

SEPT-E FM1(A) and FM2 (B)

Experienced a failure on one door. Redressed the blankets. Retested. Everything ok.

February 11 2005

Thermal Balance Phase 1

Hot deployment test

SEPT-E A Opened

SEPT-E B only rear door opened (sunside view of the door on the right remained closed)

Proceeded to bring the chamber to ambient and open chamber and verified failure. Closed door was inspected and MLI interference was found. Redressed blankets. Door opened freely. Door was then closed to proceed with tests..

February 12, 2005

Pumped down again later that day.

Thermal Balance Phase 1 Cold Door Test

SEPT-E A Doors Opened

SEPT-E B Doors Opened

Remainder of Phase 1 Thermal Balance Test OK.

March 4, 2005, 5:30 p.m.

Ambient Pre Thermal Balance Phase 2 Door Opening Test

SEPT-NS A and B All doors Opened

Blanket Configuration:

SEPT-NS B (FM2) - Blanket design is unchanged around the doors.

SEPT-NS A (FM1) – New Blanket Configuration – Changed design of blanket for recessed doors. Added a small fixed blanket that surrounds the door. Then opened up the hole for the door on the original larger blanket. This keeps the larger blanket away from the aperture. It also improved the positioning of the blanket on the door that is not recessed.

March 6, 2005, 1:24 am.

Phase 2 Thermal Balance Cold Door Test

SEPT-NS B (FM2) Old blanket configuration – 1 door does not open. The “tall” door located closer to the calorods) - (longer collimator on side with MDM connector).

SEPT-NS A (FM1) New blanket configuration – All doors open

March 8, 2005, 9:45 pm.

The door opened on 3/8/05 at ~ 9:45 pm during transition from hot operational to ambient. The blanket and the instrument were actually below room temperature at the time (-5C deg C and -2 deg C)

March 9, 2005, 10:30 am.

The chamber was opened on 3/9/05 at ~ 10:30 am and it appears that the blanket interfered with the door's latch-hook. Photo documentation of the interference points was collected at that time.

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May 9, 2005

Retested actuation of the SEPT-NS doors both hot and cold with the new flight blanket configuration.(WOA 545-289). All doors opened freely.

March 9, 2005 The door had opened while transitioning from hot to ambient. SEPT-NS FM2. (S/N 04). Note the contact between the door mechanism and the blanket.



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New blanket design which featured 2 blankets. One that was fitted around the apertures and one for the base of the unit. This new design that was implemented on all flight units. Note the clearance around the door mechanism.

