

STEREO IMPACT

PROBLEM REPORT

PR-1040

FM2 SWEA LVPS

2005-04-25

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

Assembly : IMPACT SWEA/STE-D	SubAssembly : STE-D Door
Component/Part Number:	Serial Number: FM2
Originator: David Curtis	Organization: U.C. Berkeley
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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

FM2 SWEA/STE-D unit failed post-workmanship-vibration functional test. The unit took ~450mA instead of the usual ~150mA on power-up (the system was immediately turned off). Note that the FM2 unit had passed the original qualification vibration and 3 cycles of thermal vac previously.

Analyses Performed to Determine Cause

The unit was disassembled and diagnosed. The problem was isolated to the T2 transformer in the SWEA LVPS. It was found that the transformer bobbin was floating in the core, raising concerns that the bobbin motion during vibration could have resulted in a broken wire. The transformer was carefully removed and it was indeed found that a transformer wire was broken. The reason the bobbin was loose in the core is that no staking had gotten in to hold them together when the core was staked to the board, as is usually the case. This was prevented by some kapton tape that had been added around the core to deal with a problem with the board layout. This is common between the two SWEA supplies and the STE-U bias supply in the IDPU (note only STE-U is effected by this potential failure mode, not the rest of the suite). Moving the tape slightly and inserting some staking material between the bobbin and core can fix this. An analysis shows not overstress occurred elsewhere in the system as a result of this failure (partly due to the short duration of the excess current).

Corrective Action/ Resolution

Rework Repair Use As Is Scrap

The problem was common between the 2 SWEA supplies and the 2 STE-U Bias supplies found in each IDPU.

MRB (included DPM) held 27 Mar 2005.

1. SWEA FM2 - Replaced the transformer in the LVPS with a bobbin staked to the core (SN003 replaced with SN004; SN004 passed the normal screening.) Performed a one axis workmanship vibrate and completed 4 cycles of thermal vacuum testing.
2. FM2 IDPU transformer 1107 (T6) on the STE-U bias supply board was inspected. The bobbin was staked to the core however a small amount of Uralane 5753 was added. Vibration and thermal vacuum retest is not required.
3. FM1 IDPU (currently integrated onto the Spacecraft)
Removed the unit from the observatory (5/27/2005) and removed the cover to view the transformer on the STE-U bias supply board. This unit was checked and all was ok. No uralane was added. Vibration and thermal vacuum retest is not required. Reintegrate onto the spacecraft..
4. FM1 SWEA (currently at APL but not on the spacecraft)
Deintegrate SWEA/STE-D from the SWEA pedestal:
 - Disconnected the connector between the boom and the instrument which involves 6 screws which are accessible from the outside, plus demating 2 connectors (one MDM, one 2-pin winchester). At that point the LVPS is accessible and no further disassembly is required.
 - Inspected transformer on the LVPS and the bobbin looked ok however added a small amount of Uralane 5753 for assurance and reinspected. Vibration and thermal vacuum retest is not required.

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Reintegrate the SWEA instrument onto the boom. Performed a FM1 Bench Level Boom Suite CPT test 7/12/2005 at APL prior to integration onto the observatory. Retest was successful.

Date Action Taken: _____ **Retest Results:** Successful (see above)

Corrective Action Required/Performed on other Units ✓ Serial Number(s): SWEA LVPS FM1/IDPU STE-U FM1/FM2 were all inspected. Only the FM2 IDPU and the FM1 SWEA LVPS required additional staking and were successfully retested.

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

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