

STEREO IMPACT

PROBLEM REPORT

PR-7003

SEPT-Pinpuller

2004-03-10

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 FM1	SubAssembly : Sensor
Component/Part Number:	Serial Number: A201 SN2
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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

There are eight pinpullers (TiNi Part # P5-404-5RS) installed in four SEPT units. During TV cycle 6, four pinpullers are actuated at hot soak (+50 °C), four at cold soak (-40 °C). One of four (Serial # 5054) did not fire during hot soak, but did so at the following cold soak.

Analyses Performed to Determine Cause

While still at hot soak, the pinpuller was disconnected at the TV chamber feedthrough from its power supply. The resistance between pin 1 and 2 was measured > 10 MOhms, should be 5 Ohms. When cooling down to cold soak of cycle 6, the resistance of 5 Ohms had re-established itself. The exact temperature when this happened could not be observed, as the temperature rate of change was 5 °C per minute, and the resistance was not monitored continually.

To a high degree of certainty we can exclude the chamber feedthrough and harness to be the culprit: we have wire redundant harness up to the 9-pin Sub D connector SEPTNS-P3. This connector shorts the redundant wires for ACT1 and also for ACT1 RTN. We could measure a resistance < 1 Ohm between these wires. After finishing TV test and opening the chamber at ambient, we closed the covers and restowed the pinpullers by pulling at the shaft. By manipulating the extended shaft it was possible to let the 5 Ohms resistance appear/disappear. We dismantled the pinpuller, restowed it with the TiNi extraction tool, but could then not reproduce the failure case.

The instrument configuration is shown in two attached pictures, not the failing case, though.

Corrective Action/ Resolution

- Rework Repair Use As Is Scrap

The pinpuller in question is replaced by a spare pinpuller and returned to TiNi for further inspection. It is anticipated that it will be repaired or replaced by TiNi, so we can assemble a complete spare SEPT unit.

Date Action Taken: SEP-04

Retest Results: All flight pinpullers passed TV (DEC-04)

Corrective Action Required/Performed on other Units Serial Number(s): A195 SN1,
A195 SN3, A201 SN4

Closure Approvals

Subsystem Lead: Reinhold Mueller-Mellin Date: 07-DEC-04
IMPACT Project Manager: _____ Date: _____
IMPACT QA: _____ Date: _____
NASA IMPACT Instrument Manager: _____ Date: _____

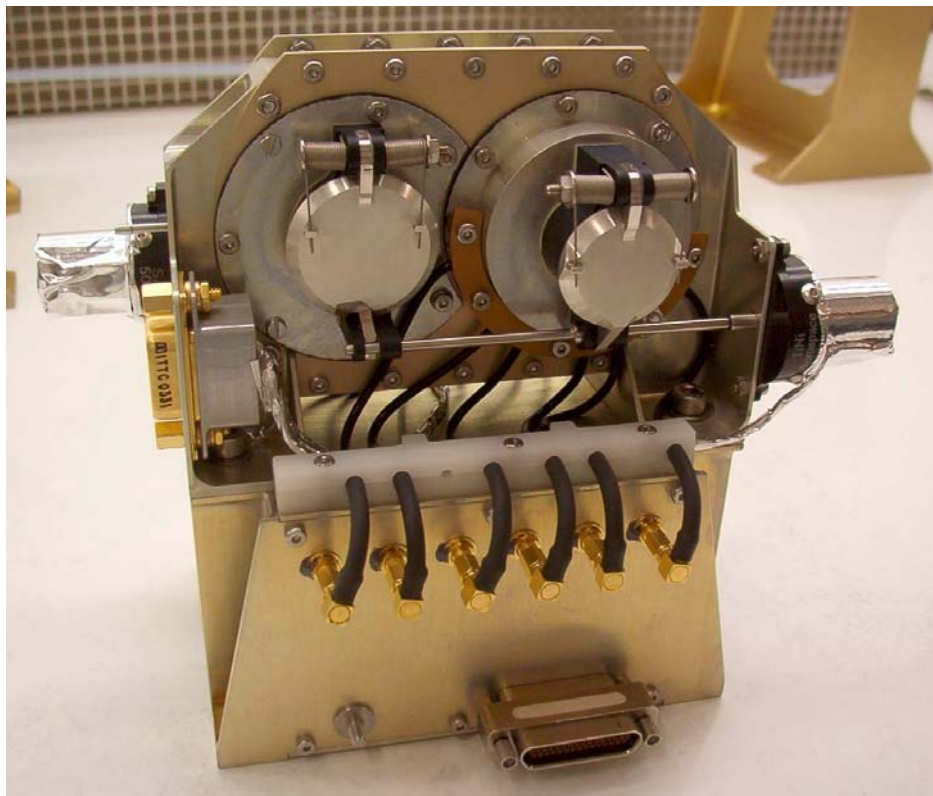
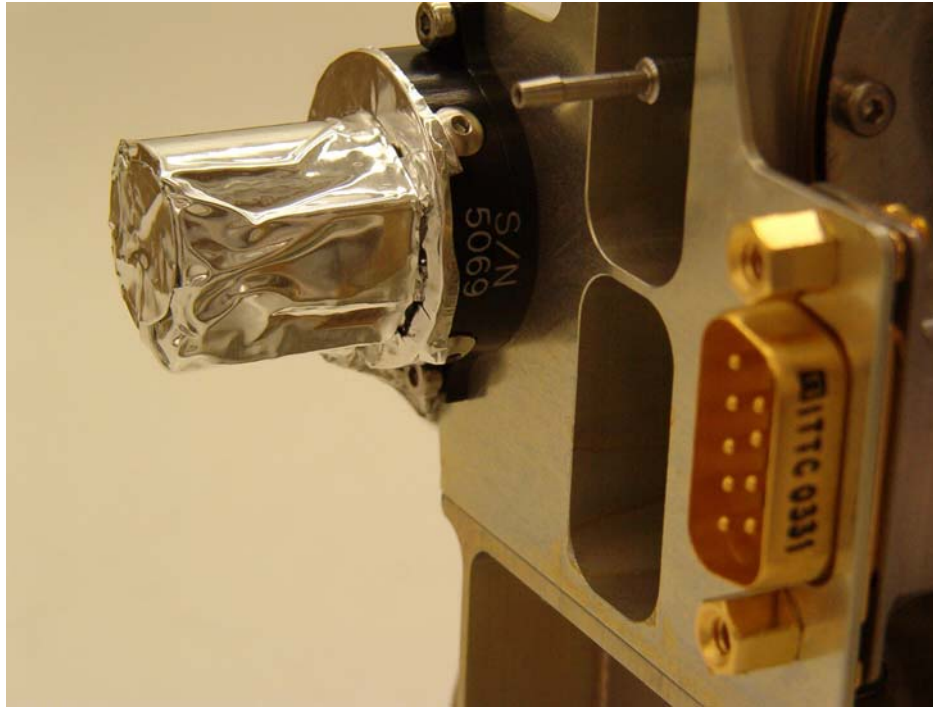
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Rework completed (September 2004):

Ten pinpullers were returned to TiNi for inspection. Some were found “questionable” w.r.t. sufficient margin in mechanical dimensions of internal contacts. They were reworked at TiNi, and all ten pinpullers returned to Kiel. Eight pinpullers were re-assembled into the sensor units.

Retest completed (December 2004):

The TV test was repeated from 25-NOV-04 through 01-DEC-04 and showed nominal pinpuller performance for all four units. Four pinpullers were actuated during hot soak, the remaining four during cold soak. It is planned to perform the hot/cold complement actuation test during Thermal Balance test at GSFC in January 2005.

Thermal Balance Test completed (February/March 2005):

Pinpullers performed flawlessly, both in hot and cold balance. Door opening had to be repeated for other reasons (see PR-7007 TB Door test failure). Retest at hot and cold balance was successful for FM1 and FM2 SEPT-NS.