PFR-140 Title: Transponder not isolated from Chassis Ground

Assembly : Transponder	**SubAssembly :**	
Component : washers	**Units Affected:** - X - - - -	**Units fixed:** - 0 - - - -
Originator: Ellen Taylor		
Organization: Swales/UCB	**Date:** 1/24/06 (date found)	
Phone: (510) 643-4054	**Email :** ertaylor@ssl.berkeley.edu	

Failure Occurred During (Check one √)

□ Functional test □ Qualification test □ S/C Integration □ Launch operations √ Other (Flight Assy)

Environment when failure occurred:

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

Problem Description

During electrical integration of the transponder (SAI-PROC-1417) on F3 Probe at Swales, it was observed that the resistance from the ground wire of the transponder to the bottom deck single point ground was measured to be 2 ohms where expected value was 1 Mohm. This problem is logged as Swales PRB-0214 (see attached).

Analyses Performed to Determine Cause

Through investigation it was found that the combination of the washer touching the conductive surface and the grounded inserts caused a ground path.

Corrective Action/ Resolution

Tape will be added to the conductive areas of the mounting feet per EO#5 for drawing C0092. A modified washer will be installed per E0#10 for drawing C0150. The modified washers will be delivered to UCB with the flight BAU. This PFR can be closed when the transponder has been flight mounted per Swales procedure with the washers installed.

Acceptance:

MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____

Problem Record PRB-0214

Swales Aerospace - Themis Project

Problem Num: PRB-0214

Date Found: 1/24/2006

Found During: WOA-00568 : Transponder installation onto Probe 3
Event # 020

Severity: Moderate
Activity Type: I & T
Status: Open
Problem Code: Assembly
System: Transponder

Found By: John Pindell
Assigned To: James Jew
Engineer: Rob Eppler
Sys Engineer:
QA: Joe Calabrese

Part Numbers Affected:	Serial Numbers:
Transponder C0092	101, 102, 103, 104, 105

Discrepancy:

While performing SAI-PROC-1417, it was observed that the resistance from the ground wire of the transponder to the bottom deck single point ground was measured to be 2 ohms. This measurement took place during section 4.8 of the procedure, which states a requirement of 1 Mohm or greater.

It was noticed that the mounting washers are in constant contact with the transponder housing. The fasteners were removed and the resistance was re-measured. The measurement displayed an open circuit (> 1 Mohm).

Cause: Design Error

The internal surfaces of the transponder mounting feet are not painted. The paint acts as an isolator so without the paint the surface is conductive. The worst case washer/isolator/screw tolerance combination will allow the washer to contact the inside of the foot. The 4X inserts in the bottom deck that the transponder mounts to are typically isolated but in some cases they are not. The combination of the washer touching the conductive surface and the grounded inserts caused a ground path.

Corrective Action

Generated EO to add tape to C0092. See Attachments: Create C0197 drawing. Fabricate new washers. See disposition.

Update 02/06/2006:

EO to C0092 is released, C0197 is released. DCO to PROC-1417 is submitted but waiting for signatures. EO to C0150 is submitted but waiting for signatures. Work will be performed after EO and DCO are signed off.

Update: EO's & DCO have been release:

Disposition: Rework to Print

EO#5 has been created for C0092. This EO adds tape to the conductive areas of the moutning feet. The tapes provides an isolation barrier. EO#10 has been added to C0150. The EO adds a new part, C0197, which is a modified washer. The modified washer provides clearance between the washer and the mounting foot wall. SAI-PROC-1417, the transponder installation procedure has been modified to use the new washer.

Transponder S/N 101 is with Probe 2 at UCB. UCB needs to be consulted with regards to this problem.

Transponder S/N 102 has been rework IAW EO#5 and redlines to WOA 568.

Transponder S/N 103 has been rework IAW EO#5 and redlines to WOA 498 .

Transponder S/N 104 has not arrived and will be taped IAW EO#5 at the time of thermal component installation..

Transponder S/N 105 has been rework IAW EO#5 and redlines to WOA 536.

Update: EO's & DCO have been release: 02/22/2006

Notes:

Note, the tape did not work with a normal washer. The washer dug into the tape.