

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- HARDWARE
NUMBER: M0-AG1-M19 -X**SUBSYSTEM NAME:** REMOTELY OPERATED FLUID UMBILICAL (ROFU)
REVISION: 01/23/03**PART DATA**

PART NAME	PART NUMBER
VENDOR NAME	VENDOR NUMBER
: ROFU	V847-544100-001
: MATE INDICATOR SWITCH MODULE ASSY	V847-544430-001

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

TWO ROFU MATE INDICATOR SWITCH MODULES V847-544430-001 ARE INSTALLED IN ORBITER DISCONNECT ASSEMBLY (ODA). EACH MODULE CONTAINS ONE MC452-0123-0003 LIMIT SWITCH.

REFERENCE DESIGNATORS: S7, S8**QUANTITY OF LIKE ITEMS:** 2
TWO**FUNCTION:**

INDICATOR SWITCH IS ACTUATED BY A PLUNGER WHEN THE ORBITER DISCONNECT AND PAYLOAD DISCONNECT ARE MATED. ONE OF THE REDUNDANT MODULES PROVIDES THE REQUIRED INDICATION DS4 ON D & C PANEL A6AI. BOTH MODULES PROVIDE TELEMETRY DATA TO MDM.

REFERENCE DOCUMENTS: V847-544430
MC452-0123

FAILURE MODES EFFECTS ANALYSIS FMEA -- FAILURE MODE

NUMBER: M0-AG1-M19-03

REVISION#: 01/23/03

SUBSYSTEM NAME: REMOTELY OPERATED FLUID UMBILICAL (ROFU)

LRU: ORBITER DISCONNECT ASSY (ODA)

CRITICALITY OF THIS

ITEM NAME: MATE INDICATOR SWITCH MODULE ASSY

FAILURE MODE: 2/2

FAILURE MODE:

PHYSICAL BINDING/JAMMING

MISSION PHASE: OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY:	102	COLUMBIA
	103	DISCOVERY
	104	ATLANTIS
	105	ENDEAVOUR

CAUSE:

BENT, JAMMED OR MISALIGNED PLUNGER, ACTUATION ARM BINDING, CONTAMINATION, DEBRIS, SET SCREW CONTACTS COVER PLATE (INSUFFICIENT OVERTRAVEL), SPRING COMPRESSED SOLID, PLUNGER BOTTOMED OUT.

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN	A) N/A
	B) N/A
	C) N/A

PASS/FAIL RATIONALE:

A)
N/A

B)
N/A

C)
N/A

- FAILURE EFFECTS -

(A) SUBSYSTEM:

ROFU LATCHING MECHANISM MAY NOT BE ABLE TO OVERCOME JAM AND ENGAGE QUICK DISCONNECTS.

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(B) INTERFACING SUBSYSTEM(S):
LOSS OF COOLING SYSTEM FOR MPLM OR OTHER PAYLOADS.

(C) MISSION:
LOSS OF MISSION OBJECTIVE.

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT.

SUCCESS PATHS REMAINING AFTER FIRST FAILURE: 0

- TIME TO EFFECT -

REACTION TIME: SECONDS

-DISPOSITION RATIONALE-

(A) DESIGN:
THE TWO SWITCH MODULES ARE INSTALLED WITHIN THE ODA HOUSING. THE LIMIT SWITCH AND ACTUATING ARM IN EACH MODULE ARE INSIDE A MACHINED HOUSING WITH COVER PLATE. HOLE IN COVER PLATE MAINTAINS PLUNGER ALIGNMENT. PLUNGER OVERTRAVEL IS .08 INCH MINIMUM. PLUNGER COMPRESSES SPRING TO ROTATE ARM AND OPERATE SWITCH.

(B) TEST:
THE ROFU MECHANISM IS CERTIFIED PER CR 60-44-544100-001. SYSTEM QUALIFICATION TESTS WITH THE SWITCH MODULES INSTALLED INCLUDE QD MATING FORCE, DRIVE MOTOR NORMAL AND CONTINGENCY OPERATION, ENGAGEMENT FORCES ON PAYLOAD, LOAD TRANSFER DURING MATE PROCESS, DISCONNECT ENGAGEMENT WITH LATERAL AND ANGULAR MISALIGNMENT, AND OPERATIONAL LIFE TESTS. ACCEPTANCE REQUIREMENTS INCLUDE SWITCH MODULE ADJUSTMENT PER DRAWING V847-544430 AND RIGGING OF ARM AND LATCH MECHANISMS PER SPECIFICATION ML0308-085.

GROUND TURNAROUND TESTING WILL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE OMRSD.

(C) INSPECTION:
RECEIVING INSPECTION
MATERIALS AND PROCESS CERTIFICATIONS VERIFIED BY INSPECTION

CONTAMINATION CONTROL
INSPECTION VERIFIES CLEANLINES IS MAINTAINED AND CORROSION PROTECTION IS PER MA0608-301

ASSEMBLY/INSTALLATION

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DIMENSIONS OF DETAIL PARTS AND FASTENER INSTALLATIONS ARE VERIFIED BY INSPECTION. ASSEMBLY AND RIGGING OF THE SWITCH MODULE, INCLUDING PLUNGER OVERTRAVEL AND FREE MOVEMENT, ARE VERIFIED BY INSPECTION.

TESTING

RIGGING OF SWITCH MODULE PRIOR TO DELIVERY IS VERIFIED BY INSPECTION PER DRAWING REQUIREMENTS.

HANDLING/PACKAGING

HANDLING AND PACKAGING REQUIREMENTS ARE VERIFIED BY INSPECTION.

(D) FAILURE HISTORY:

CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATA BASE.

(E) OPERATIONAL USE:

NONE

- APPROVALS -

S&R ENGINEER	:A. NGUYEN	:/S/ ANH NGUYEN_____
CARGO/INTEG ITM.	:J. CAPALENI	:/S/ BOB DUEEASE FOR_____
DESIGN ENGINEER	:P. HOE	:/S/ PHAM HOE_____
SSM	:L. J. SALVADOR	:/S/ PHAM HOE FOR_____
NASA/DCE	:B. BROWN	:/S/ B. BROWN_____
MOD	:K. SMITH	:/S/ K. SMITH_____
SR&QA	:H. MALTBY	:/S/ HARRY MALTBY_____
USA/SAM	:R. SMITH	:/S/ R. SMITH_____
USA CARGO/INTG ELEMENT	:S. KUNKEL	:/S/ S. KUNKEL_____
USA ORBITER ELEMENT	:S. LITTLE	:/S/ SUZANNE LITTLE_____