

FAILURE MODE EFFECTS ANALYSIS/CRITICAL ITEMS LIST

FMEA NUMBER: EC-MUT-05	ORIGINATOR: JSC	PROJECT: EDFT-04
PART NAME: BASE JOINT ASSY	LRU PART NUMBER: SEG33106880-301,303,305,307	QUANTITY: 1
PART NUMBER: SED39127215-301	LRU PART NAME: MUT	SYSTEM: DTO 671
DRAWING: SEE P/N	SUBSYSTEM: EVA	EFFECTIVITY: STS-76 & Subsequent

CRITICALITY:

CRITICAL ITEM? YES NO *

SUCCESS PATHS: 3
SUCCESS PATHS REMAINING: 2

CRITICALITY CATEGORY: 1R/3

REDUNDANCY SCREENS:

- A - 1.) C/O PRELAUNCH: PASS
- 2.) C/O ON ORBIT: N/A for NSTS
- B - 3.) DETECTION FLIGHT CREW: PASS
- 4.) DETECTION GROUND CREW: N/A for NSTS
- C - 5.) LOSS OF REDUNDANCY FROM SINGLE CAUSE: PASS

FUNCTION: The MUT base joint assembly allows rotation about two multiple-disk friction clutch joints, which enables the MUT base joint assembly to be manipulated by a crewmember to achieve desired configurations for different EVA operations. The two clutched joints on the MUT base joint assembly are capable of 360 degrees of continuous rotation. The base joint assembly attaches to the MMWS using a tapered ball lock latching mechanism. The tapered ball lock latching mechanism uses a toggle latch to actuate the balls for either attaching or releasing from the MMWS. Rotation at the interface of the tapered ball lock latching mechanism and MMWS is prevented via a housing that fits over a square boss on the MMWS.

FAILURE MODE: Inadvertent release of MUT base joint from MMWS.

CAUSE: Lock lever pin backs out, ball deforms hole and falls out, spring failure.

FAILURE DETECTION: Visual/Tactile.

REMAINING PATHS: EVA hook is single fault tolerant.

EFFECT/MISSION PHASE: EVA

CORRECTIVE ACTION: Discontinue use of MUT and restow for deorbit and landing.

-FAILURE EFFECTS-

END ITEM: MUT does not function properly and must be restowed for deorbit and landing.

INTERFACE: None.

MISSION: Partial loss of remaining DTO objectives.

CREW/VEHICLE: Possible damage to EMU or Orbiter due to loose equipment impact after multiple failures [up to 90 lb (ORU plus MUT traveling at up to 2 ft/sec)]. Worst case scenario for the MUT is a failure during translation of an ORU weighing 75 lbs. The loose ORU has the potential to impact the EMU possibly puncturing it which would result in loss of an EVA crewmember.

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HAZARD INFORMATION:

HAZARD: YES _____ NO _____ *

HAZARD ORGANIZATION CODE: N/A

HAZARD NUMBER: N/A

TIME TO EFFECT: Seconds.

TIME TO DETECT: Seconds.

TIME TO CORRECT: Immediate.

REMARKS:

-RETENTION RATIONALE-

- (A) DESIGN: N/A
 - (B) TEST: N/A
 - (C) INSPECTION: N/A
 - (D) FAILURE HISTORY: N/A
 - (E) OPERATIONAL USE: N/A
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PREPARED BY: M.D. Garner

REVISION:

DATE: 2/22/96