

CRITICAL ITEMS LIST

ASSY NOMENCLATURE: WINCH ADAPTER

SYSTEM: 4.2

ASSY P/N: SED 33102348

SUBSYSTEM: 5.1

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FMEA		NAME, QTY & DRAWING REF DESIGNATION	CRIT'Y	FAILURE MODE AND CAUSE	FAILURE EFFECT OR (EMG IFEM)	RATIONALE FOR ACCEPTANCE
REF	REV					
IC		EVA WINCH ADAPTER ASSEMBLY, (1) SED 33102348	2/1R	Mode: Rope breaks Cause: Material failure	Unable to cradle RMS which prevents closing the payload bay doors. Redundancy RMS jettison system	<p>1. Design Features to Minimize Failure Mode.</p> <ul style="list-style-type: none"> a. Safety factor of 1.4. b. Safety margin of 3.5. c. Rope is made of 5/16" Kevlar which is known to be compatible with temperature and environment conditions d. Working load of 584 lbs. <p>2. Test or Analysis to Detect Failure Mode.</p> <p><u>Acceptance</u></p> <p>Functional Test - Complete functional testing to assure that all parts function properly</p> <p><u>Certification</u></p> <ul style="list-style-type: none"> a. Certification test consists of: deploy and reel in 5 feet of rope, confirm that the reel rotates freely and does not free-wheel for more than one half turn, apply a 840 lbs load to the hook while the ropes engaged in cam cleats, and confirm that the assembly does not fail under load b. Thermal qualification testing to certify this tool for the worst case PSA storage temperature environment of -250°F to +350°F for 160 hours. <p><u>Turnaround</u></p> <ul style="list-style-type: none"> a. Complete functional testing will be performed once a year, or after each mission use to assure that all parts function properly b. Replace Kevlar rope after each mission use c. Inspect Kevlar rope for fraying or other damage once a year

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CRITICAL ITEMS LIST

ASSY NOMENCLATURE: WINCH ADAPTER

SYSTEM: 4.2

ASSY P/N: SED 33102348

SUBSYSTEM: 5.7

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FMEA		NAME, QTY & DRAWING REF DESIGNATION	CRIT'Y	FAILURE MODE AND CAUSE	FAILURE EFFECT OR END ITEM	RATIONALE FOR ACCEPTANCE
REF	REV					
1C		EVA WINCH ADAPTER ASSEMBLY (1) SED 33102348 (Continued)	2/1R	Mode: Rope breaks Cause: Material failure	Unable to cradle RMS which prevents closing the payload bay doors. Redundancy - RMS jettison system.	<p>3. Inspection.</p> <p><u>Manufacturing</u> (Completed)</p> <ul style="list-style-type: none"> a. Verify as built configuration b. Verify certificate of compliance for Kevlar rope. <p><u>Turnaround</u></p> <ul style="list-style-type: none"> a. Perform inspection for fraying of rope or other indications of potential failures, surface contamination, and clean according to P578/PIA-05001. b. Verify completion of functional test for reacceptance <p>4. Failure History.</p> <p>ISCEC0144: During the -200°F cold case test the Teflon rollers would not rotate and the hook latch would not close completely by itself and operated stiffly.</p> <p>HBC0110: Rope sheath around Kevlar rope core broke at 750 lbs. during a load test of winch hook adapter to 840 lbs. To relieve the bite load during operation, the rope will be wrapped around the cam cleat block once and then through the center of the cam cleats. The test was repeated successfully (TPS 28720001)</p> <p>5. Operational Use.</p> <ul style="list-style-type: none"> a. <u>Operational Effect of Failure</u> The length of the EVA task would be increased if the rope broke b. <u>Crew Action</u> The crew would tie the rope back together. This would not keep it from stowing on the reel. The crew would also have to stop to help the knot past the snatch block if the snatch block was being used to guide the winch adapter rope c. <u>Crew Training</u> This crew action will be incorporated into the EVA crew training flow d. <u>Mission Constraints</u> None identified. e. <u>In Flight Checkout</u> The rope will be inspected for fraying and bad spots as it is being used

PREPARED BY P. E. Thayer

SUPERSEDED DATE

APPROVED BY T. D. Buss

DATE: 9/20/00

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