

CRITICAL ITEMS LIST

ASSY NOMENCLATURE: EVA WINCH

SYSTEM: 4.1, 4.2 AND 4.3

ASSY P/N: SED 33101570

SUBSYSTEM: 5.3

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FMEA		NAME, QTY & DRAWING REF DESIGNATION	CRITY	FAILURE MODE AND CAUSE	FAILURE EFFECT OR END ITEM	RATIONALE FOR ACCEPTANCE
REF	REV					
38		EVA WINCH, (2) SED 33101570	Z/R	<p>Mode: Rope break</p> <p>Cause: Material failure</p>	<p>1. Unable to cradle RMS or payload which prevents closing payload bay doors.</p> <p>2. Unable to close payload bay doors.</p> <p>Redundancy -</p> <p>1. RMS jettison system</p> <p>2. Second EVA winch.</p>	<p>1. Design Features to Minimize Failure Mode.</p> <ul style="list-style-type: none"> a. Safety factor 1.4 b. Safety Margin of 10 c. Rope is made of 3/8" Kevlar which is known to be compatible with temperature and environment conditions d. Torque indicator provided to indicate to crewmember when 50 lb. loading occurs, on handle <p>2. Test or Analysis to Detect Failure Mode.</p> <p><u>Acceptance</u></p> <p>Functional Test -- Complete functional testing to assure that the controls operate smoothly and that the rope can be extended and retracted</p> <p><u>Certification</u></p> <ul style="list-style-type: none"> a. Qualification test consists of: working load test with 200 lb. and 600 lb. static loads, verification of smooth operation with static loads applied, verification that a max force (during one hand operation) of approximately 50 lbs. is exerted during ratcheting with the crank grip in the 90° position b. Stress analysis to certify this tool for 584 lb. working load with 1.4 safety factor c. Thermal qualification testing to certify this tool for a temperature environment of -200°F to +350°F for 100 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 the controls operate smoothly and that the rope can be extended and retracted b. Replace Kevlar rope after each mission use c. Inspect Kevlar rope for fraying or other damage once a year

PREPARED BY P. F. Hootner

SUPERSEDED DATE

APPROVED BY T. O. Ross

DATE 8/11/83

EXERCISE M
 ATTACHMENT 1
 1-8

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REF	REV					
38		EVA WINCH, (2) SED 33101570	2/1R	<p>Mode: Rope breaks</p> <p>Cause: • Material failure</p>	<p>1. Unable to cradle RMS or payload which prevents closing payload bay doors.</p> <p>2. Unable to close payload bay doors.</p> <p>Redundancy -</p> <p>1. RMS jettison system</p> <p>2. Second EVA winch</p>	<p>3. Inspection.</p> <p><u>Manufacturing</u>, (Completed)</p> <p>a. Verify the as-built configuration.</p> <p>b. Verify certificate of compliance for Kevlar rope.</p> <p><u>Turnaround</u></p> <p>a. Perform visual inspection for fraying of rope or other indications of potential failure, surface contamination, and clean according to P52B/PIA-05001.</p> <p>b. Verify completion of functional test for reacceptance.</p> <p>4. Failure History.</p> <p>JH004 - A deterioration of the control handle positioning springs that correctly position the spool pawl. New springs and spring guides have been fabricated and installed on all winch assemblies, with the exception of 5th 1001, the qualification unit. All units fitted with the new spring guide assemblies were functionally tested by reeling out 5 feet of rope, retracting by automatic reel in and ratchet handle, and verify ratchet-out feature.</p> <p>Reference TP5 2B22001B.</p> <p>5. Operational Use.</p> <p>a. <u>Operational Effects of Failure</u> The rope cannot be easily attached to the PLBD or RMS rope reel.</p> <p>b. <u>Crew Action</u> Length permitting, the rope can be tied to the PLBD rope reel. If the break point makes the rope too short, the rope can be tied to the rope reel or payload retention device for PLBD closing and then the PRD can be used for finishing the door closing the RMS cradling.</p> <p>c. <u>Crew Training</u> These crew actions will be incorporated into the EVA crew training flow.</p> <p>d. <u>Mission Constraints</u> None identified.</p> <p>e. <u>In-flight Checkout</u> The crew will visually inspect the rope as it is being pulled out for use.</p>

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 ATTACHMENT 1
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PREPARED BY: R. E. [unclear]

SUBMITTED DATE:

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DATE: 9/20/99

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