CRITICAL ITEMS LIST

ASSY NOMENCLATURE: *EVA WINCH*
ASSY P/N: *SED 33101570*

SYSTEM: *4.1, 4.2 AND 4.3*
SUBSYSTEM: *5.3*

FMEA REF	FMEA REV	NAME, QTY & DRAWING REF DESIGNATION	CRIT'Y	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	RATIONALE FOR ACCEPTANCE
3D		EVA WINCH, (2) SED 33101570	2/1R	Mode: Transmission jams Cause: • Material failure • Contamination	1. Unable to cradle RMS or payload which prevents closing payload bay doors 2. Unable to close payload bay doors Redundancy - 1. RMS jettison system. 2. Second EVA winch.	1. **Design Features to Minimize Failure Mode** a. Safety factor of 1.4. b. Safety margin of 2. c. Stainless steel gears enclosed in aluminum housing. d. Tolerances used on parts to minimize binding caused by temperature extremes or contamination and to allow for dry film lubrication. e. Enclosed in aluminum case to prevent external entrance of contaminants. 2. **Test or Analysis to Detect Failure Mode.** <u>Acceptance</u> Functional Test -- Complete functional testing to assure that the controls operate smoothly and that the rope can be extended and retracted <u>Certification</u> 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 lbs. 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 160 hours <u>Turnaround</u> 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

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3D		EVA WINCH, (2) SED 33101570 (Continued)	2/1R	**Mode:** Transmission jams **Cause:** • Material failure • Contamination	1. Unable to cradle RMS or payload which prevents closing payload bay doors. 2. Unable to close payload bay doors. Redundancy - 1. RMS jettison system. 2. Second EVA winch.

RATIONALE FOR ACCEPTANCE

3. **Inspection.**

<u>Manufacturing</u> (Completed)

a. Accomplish NDE on piece parts prior to assembly.
b. Verify certificate of compliance on materials.
c. Verify as-built configuration.
d. Clean and apply lubrication according to drawing requirements.

<u>Turnaround</u>

a. Perform visual examination for damage to transmission or separable parts during cleaning.
b. Inspect for surface contamination and clean according to PS28/PIA-05001.
c. Verify completion of functional test for reacceptance.

4. **Failure History**

JH0004 - 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 S/N 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. Reference TPS 28220018.

JH0007, JH0008 - During thermal testing at the -200°F cold functional test, the ratchet control lever would not move into its detents, the rope could not be reeled out, and the crank grip would not unstow. All units were relubricated with Dow corning moly kote 321R and functionally tested successfully (TPS 51820012).

5. **Operational Use.**

a. <u>Operational Effect of Failure</u>. The winch cannot be used if the transmission jams.
b. <u>Crew Action</u>. The PRO can be used to close the PLBD and cradle the RMS.
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>. No in-flight checkout of the winch will take pla... ...efore its use during EVA.

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PREPARED BY: P. F. Hooper SUPERSEDING DATE: APPROVED BY: F. O. Rust DATE: 9/7/88

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