

CIL
EMU CRITICAL ITEMS LIST

12/26/91 SUPERSEDES 01/02/90

ANALYST:

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NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
COOLING CONTROL VALVE, ITEM 321 ----- BV202403-1 (1)	2/2	321FMD1: Internal leakage (excessive cooling). CAUSE: Seal failure, Spool rotating seal failure, Housing static seal (farthest from handle) failure, increased clearance between spool and housing.	END ITEM: Excessive coolant bypass from the sublimator outlet to the LCS. DPE INTERFACE: Excessive cooling during minimum load periods. MISSION: Terminate mission if crew is too uncomfortable. If cooling is oppressive, close valve 157 to shutdown feedwater to sublimator. CREW/VEHICLE: None.	A. Design - The seals are lubricated with Braycote at assembly and are lubricated with water during usage. 40° rings are made from elastomeric (viton) material. Surface finish, seal configuration, dimensional tolerances and rigidity of construction and provide seal squeeze under all loading conditions. The housing and spool are Nitronic 80 for anti-galling and low wear properties. B. Test - Component Acceptance: An internal leakage test is performed per A1-E-321-2 in which the valve is set to the "H" hot position. A flow of 235-245 lbs/hr H2O is established thru the valve and a differential pressure of 0-2.7 in H2O is set between the sublimator inlet port and the bypass circuit. Leakage from the sublimator port to the cooling circuit must not exceed 2.0 lbs/hr. PDAs: An internal leakage test is performed per SEMU-60-015 with the valve in the minimum cooling position. A flow of 240-245 lbs/hr H2O is established thru the valve and a differential pressure of 0-2.7 in H2O is set between the sublimator port and the bypass circuit. Leakage from the sublimator port to the cooling circuit must not exceed 2.0 lbs/hr. Certification: The item completed the 15 year structural vibration and shock certification requirement during 10/83. The item completed 10,000 cold-hot-cold cycles during 7/85 which fulfilled the cycle certification requirement of 4,024. Engineering changes 42806-229 (facilitated valve acceptance at DCN level by providing consistency between component spec. and S/AD II) and 42806-515 (clarified Flow Requirement) have been incorporated and certified by analysis/similarity since this configuration was certified. C. Inspection - O-ring grooves are 100% inspected per drawing dimensions and surface finish. O-rings are inspected for surface characteristics per SVIS

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NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	2/2	321FM01		<p>3432; 100% for Class I & II, and at least 1.5 AQL for Class III.</p> <p>Internal leakage caused by increased clearance between the housing and spool are prevented by inspection of the sealing bore in the housing and the spool outer diameter to insure proper fit. These details are further controlled as "matched sets" after the completion of torque test.</p> <p>D. Failure History - None.</p> <p>E. Ground Turnaround - Tested per FEMU-R-001, cooling control valve and common connector flow/delta P check.</p> <p>F. Operational Use - Crew Response - Detection - Sensory (crawnen discomfort) Pre/PostEVA: Troubleshoot problem, if no success, consider third EMU if available. Otherwise, use battery power and disconnect SCU when cooling is excessive. Continue EVA. EVA: When cooling is excessive, turn off feedwater supply to sublimator. Continue EVA. Special Training - No training specifically covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define sa/mo go criteria related to EMU thermal control.</p>