NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		141FM05		
GAS TRAP, ITEM 141 --- SV784943-5 (1) OR SV805257-2 --- (1)	2/1R	Internal leakage. Separator delivery orifice bypass leakage. Failure, 0-ring seals bypass leakage.	END ITEM: Excessive water flow from gas trap to water separator. GFE INTERFACE: Water carryover into the ventilation loop. Possible helmet fogging. MISSION: Terminate EVA. Water carryover into the space suit assembly. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of SOP. TIME TO EFFECT /ACTIONS: Minutes. Terminate EVA by opening purge valve to activate SOP and return to vehicle. TIME AVAILABLE: Minutes. TIME REQUIRED: Seconds. REDUNDANCY	A. Design - P/Ns SV784943 and SV805257: There are two orifice bypass leak paths, one through a radial type o-ring and one through a face type o-ring. The o-ring seal design configuration dimensions and the rigidness of the assembly provide squeeze under all load conditions. Water temperature and pressure are not extreme (32-120 F, 10 psid). B. Test - Component Acceptance: P/Ns SV784943 and SV805257: The item orifice cover is internally leakage tested by pressurizing the inlet to 29.7-30.2 psia for 5 minutes minimum. The orifice is capped and the H2O outlet is capped. The leakage must not exceed 2 bubbles/minute max as observed from cover and interfacing screws. PDA: P/Ns SV784943 and SV805257: The water separator is performance tested with the PLSS in the I.V. mode. With the water circuit charged and the fan/pump operating, the separator outlet pressure shall be 16.5 - 17.0 psig at a flow of 10-12 lbs/hr H2O. Excessive flow past O-seals would not pass this test. Certification: Certified for a useful life of 112 hours (ref. EMUM-583). P/N SV805257 Certified for a useful life of 188 hours (ref. EMUM-680). C. Inspection - The O-seals are 100% inspected for dimensional requirements and surface defects. D. Failure History - Previous Design (P/N SV784943) H-EMU-141-D003 (8/19/83) Gas trap failed component level internal leakage test. The failure was due to incomplete sealing of the epoxy around the cover. The Gas Trap was redesigned to incorporate an O-ring seal place of the bonded joint. SV805257: H-EMU-141-D010 (07/01/93) - Enhanced Gas Trap exhibited high orifice flowrate at the assembly level with nominal orifice flow at the piece part level. Most probable cause was a damaged or rolled internal "O" ring in the gas trap assembly that added to the orifice flow. Op sheets were revised to inspect "O" ring integrity for the gas trap/fixture interface seals. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, Fan/Pump/Separator/Vent Flow Sensor Performance. None for EET processing. F. Operational Use - P/Ns SV784943 and SV805257: Crew Response - Pre EVA: Trouble shoot problems, if unsuccessful, consider 3rd EMU. EMU is go for SCU without fan.

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			SCREENS: A-PASS B-PASS C-PASS	EVA: If significant amounts of water enter helmet via vent loop, open helmet purge valve and deactivate fan. Terminate EVA. Caution: possible clogging of EMU purge valve if water freezes at valve outlet. Training - Standard training covers this failure mode. Crew are trained in terminate EVA and abort EVA procedures. Operational Considerations - RTDS allows ground monitoring of EMU systems. EVA check list procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define EMU as go to remain on SCU (available for rescue if required). Flight rules define loss of EMU for loss of thermal control and for loss of ventilation flow.

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-141 GAS TRAP

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____ 3/27/02
HS - Project Engineering

Approved by: _____ 9/30/02
NASA – ~~SSA~~/SSM
LCS

_____
HS - Reliability

_____
NASA – EMU/SSM

_____
HS - Engineering Manager

_____
NASA - S & MA

_____ 10-15-02
NASA - MOD

_____ 10-22-02
NASA - Crew

_____ 10/24/02
NASA - Program Manager