NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FAN/SEPARATOR/PUMP/ MOTOR ASSEMBLY, ITEM 123 SW787994-8 (1)	2/1R	F23EM04: Separator pitot clogs. CAUSE: Entrained contamination, weld blockage.	END ITEM: Water from the gas trap and the condenser slurper will accumulate in the rotating drum and be discharged into the vent flow to the helmet. OFF INTERFACE: Water carryover into the space suit assembly. Discharge of up to 10 lbs. water from the water tanks into the suit. Potential helmet fogging. MISSION: Terminate EVA, Loss of use of one EMU. CREW/VEHICLE: None for single failure. Possible crew loss with loss of SOP.	A. Design - The pitot hole diameter is 0.033 inches. It is protected from contamination in the separator by eight 0.022 inch diameter holes between the drum and the pitot trough. The upstream sublimator slurper holes are 0.016 inches in diameter, and the gas trap delivery line has seven 0.012 diameter holes. B. Test - Certification Test - The item completed the 10,000 hours of operation and 6,400 on/off cycles exceeding the 15 year certification requirement by more than a factor of three (3). The 15 year structural vibration, electrical vibration and design shock was completed 12/86. The following engineering changes have been incorporated and certified since this configuration was certified: 42806-362-35 (change Power Consumption Requirement - more amps), 42806-406 (incorporate Nitronic 60 Nut), 42806-424 (Seal Cup change to ensure a good weld), 42806-818 (Water Pump changes IOK inspection in areas susceptible to contamination, move break edges and deburring operations to close RDN J-EMU-123-010), 42806-936 (change bearing limited life requirement). Component Acceptance Test - The test fixtures and interfacing hoses are cleaned to MS5150 level GH150. The test facility O2 circuit is cleaned to MS5150 EH50A. The item is performance tested at EVA and IVA conditions. Any clogging of the separator pitot would be detected during this test. In the EVA the separator flow rate is set to 8.2-8.6 pph at a pressure of 13.9-14.9 psid, in IVA the separator flow rate is set to 8.7-9.1 pph at a pressure of 14.9-16.7 psid. Visual H2O carryover would indicate a clogged tube. No carryover is permitted in the vent loop. The item is then subjected to a burn-in cycle test where it must operate for 24 hours. It is cycled 3 times at 3 hours IVA and 3 hours EVA conditions. The item is performance tested again in the EVA condition, as per above. CEI PDA Test per SEMU-60-010 - The item is cycled (on for two (2) hours, then off), then (10) times in the IVA mode to give 20 hours minimum run time. The separator is then performance tested, where is

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	2/1R	123FM04:		must pass 75.5-90.0 cc/min. H2O at a separator outlet pressure of 16.5-17.5 psig.

C. Inspection -
SV767996-8 F/P/S Level of Assembly -
Both the pitot (SV767718-2) and the drum and ring assembly (SV769430-1) are cleaned to HS3150 EM1508 prior to assembly. Prior to inprocess testing, there exists both an HS and a government MIP to verify that the F/P/S details were cleaned to the appropriate levels prior to installation.
An IPT is performed with the item assembled to verify: a) Water separator flow is 0.2-0.6 pph. b) Separator pressure rise 13.9-16.9 psid. c) No ventloop carryover from the separator.

SV767718-2 Pitot -
Weld plug (find No. 3) is welded followed by an x-ray and then a physical check for obstructions in the water passage. If obstructed, an operation is included to EDM out the obstruction. The item is then flow tested to verify flow is 10 lbs/hr minimum at an inlet pressure of 3 +/- .25 psi. Inlet pressure is applied at annulus -N-. Weld plug No. 4 is welded followed by an x-ray and then a physical check for obstructions in the water passage. If obstructed, an operation is included to EDM out the obstruction. The item is then flow tested to verify flow is 10 lbs/hr minimum at an inlet pressure of 3 +/- .25 psi. Inlet pressure is applied at annulus -W- (water separator outlet). The item is final contour ground and another x-ray is performed of the weld.

The .022 dia holes in the drum and ring assembly are 100% inspected for correct size.
The .012 dia holes in the gas trap are 100% inspected for correct size.
The .016 dia holes in the slurper are 100% inspected for correct size.
The .033 dia water passage in the pitot is 100% inspected for correct size.

D. Failure History -
EMU-123-A002 (2-11-80) - Water carryover caused by weld blockage in pitot. A flow check during fabrication was then

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	2/1R	123FM04:		Imposed, EMU-100-C001 (1-17-79) old configuration. H-EMU-123-D012 (3/21/88) water carryover caused by dislodged weld plug in pitot separator. The plug was improperly seated during welding. Subsequent grinding removed the weld, dislodging the plug. EC 163402-224 incorporates a pre-weld plug seated location inspection and a post-weld chemical etching after grinding and prior to dye penetrate to allow visual verification of the weld. E. Ground Turnaround - Tested per TEMU-M-001, SEMU Post Chamber Drain Port Condensate Test. F. Operational Use - Crew Response - PreEVA: Troubleshoot problem, if no success, consider EMU 3 if available, EMU go for SCU without ten. EVAr If significant amounts of water detected entering helmet vent duck or helmet fogging occurs terminate EVA. Open helmet purge valve to anti-fog helmet as required. Training: Standard EMU training covers this failure mode. Operational Considerations - Flight rules define go/no go criteria related to EMU suit thermal control. Flight rules define EMU to remain on SCU (available for rescue if required). EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Real time data System allows ground monitoring of EMU systems.