NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FAN/SEPARATOR/PUMP/ MOTOR ASSEMBLY, ITEM 123 SV787996-8 1)	2/1R	123#001: Restricted vent flow. CAUSE: Contamination build up on the fan rotor surfaces or in the volute housing passage.	END ITEM: Loss of or reduction in vent flow to the helmet. CPE INTERFACE: Reduction in CO2 and moisture removal capability. Increase in suit temperature, humidity and CO2 level. Possible freeze-up of the sublimator (Item 140) coolant passages. MISSION: Terminate EVA. Possible loss of use of one EMU. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of vent flow sensor output or SOP.	A. Design - Particulate contamination in the ventilating gas of the EMU shall not exceed 0.1 mg/m3 and the CCC, Item 440, provides this filtration level. B. Test - Component Acceptance Tests - A performance test is performed at "EVA" and "IVA" conditions to verify the integrity of the fan. At "EVA" the fan inlet pressure is set to 3.89 - 3.95 psia, with a flow rate of 6.27-6.57 ACFM O2, the differential pressure across the fan must be a minimum of 3.22 inches H2O. At "IVA" the fan inlet pressure is set to 18.35-18.6 psia, with a flow rate of 7.13-7.33 ACFM O2, the differential pressure across the fan must be a minimum of 13.56 inches H2O. The item is subjected to a burn-in cycle test where it must operate for 24 hours. It is cycled 3 times at 3 hours "IVA" and 5 hours "EVA" conditions. The item is performance tested again in the "EVA" condition, as per above. CEI PDA Test - The item is cycled (on for two (2) hours, then off) ten (10) times in the EVA mode to give 20 hours minimum of run time. The item is then performance tested in the IVA and PRESS modes. At IVA the fan outlet pressure is 0.4-1.4 psig and a flow of 6.72 ACFM O2, the differential pressure across the fan must be a minimum of 3.56 inches H2O. At PRESS the fan outlet pressure is 4.2-4.4 psig and a flow of 6.5 ACFM O2, the differential pressure across the fan must be a minimum of 3.56 inches H2O. The test fixtures and interfacing hoses are cleaned to MSFC-SPEC-164A. The test facility O2 circuit is cleaned to MSFC-SPEC-164A. Certification Test - The item completed 10,000 hours of operation and 8,400 on/off cycles exceeding the 15 year certification requirement by more than a factor of three. The 15 year structural vibration, electrical vibration, and design shock was completed 12/84. The following engineering changes have been incorporated and certified since this items certification: 42806-342-25 (change power consumption requirement - more amps), 42806-406 (incorporate Nitronic 60 Retaining Nut), 42806-424 (seal cup change to assure a good

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	2/1R	123FH01:		mold), 42806-816 (water pump changes inspection in areas that or susceptible to contamination, move breakedge and deburring operations to close RDR J-EMU-125-010), 42806-934 (change bearing limited life requirement).

C. Inspection -
Fan Rotor, volute housing and fan end of motor housing are cleaned to HB3750 EM1500 prior to assembly.
Volute positioning procedure centers the volute around the fan rotor and shims volute away from fan rotor to proper height to provide maximum clearance all around rotor of .039" min. (HSD MIP on this operation).
During balance of rotative assembly and subsequent anodizing and cleaning of fan rotor, the item is mounted in a rig cart which provides a positive pressure of N2 gas through the bearings, around the fan and out the volute horn to prevent entrance of contaminants.
A MIP'd operation just prior to inprocess testing verifies that all assembled details were cleaned to prescribed cleanliness levels. (i.e., cleaning slips are verified for all details).
An IPT is performed to verify base point specifications for fan flow in both the EVA and IVA modes. If fan flow is found to be out of spec, an operation is provided for reshimming of the volute.
The item is packaged to maintain cleanliness at all times.

D. Failure History -
None.

E. Ground Turnaround -
Tested per SEMU-R-001, Water Servicing Leakage and Gas Removal Test, Para. 7.3.3.2.1.1.2.

F. Operational Use -
Crew Response
Pre EVA: Trouble-shoot problem, if no success consider EMU 3 if available. EMU go for SCU ops without fan.
EVA: When CWS data confirms loss of ventilation flow, terminate EVA.
Training

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	2/1R	123FM01:		Standard EMU training covers this failure mode. Operational Considerations Flight rules define go/no go criteria related to ventilation, flow and CO2 control. Flight rules define EMU go 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.