

| NAME P/N QTY | CRIT | FAILURE MODE & CAUSES | FAILURE EFFECT | RATIONALE FOR ACCEPTANCE |
|---|------|--|--|---|
| ----- | | | | |
| | | 424FM02 | | |
| DRAIN (SINGLE CARTRIDGE) PARTICULATE FILTER, ITEM 424 ----- SV784959-1 (1) | 2/2 | Restricted flow through drain line filter. SV784959: Entrained contamination. | END ITEM: Restricted water flow path through filter. GFE INTERFACE: Unable to drain water from EMU. Unable to complete water recharge sequence or dump condensate during IV operations. | A. Design - SV784959: The 2 micron filter element is made from sintered stainless steel to minimize corrosion. For further corrosion protection, the filter housing is made from 347 stainless steel that is teflon coated at the o-seal grooves which contact polypropylene sleeves which separate the anodized aluminum bacateria filter housing from the liquid. The filter element area is 14.5 square inches to minimize clogging. |
| OR DRAIN (DUAL CARTRIDGE) PARTICULATE FILTER, ITEM 424 INNER CARTRIDGE/OUTER CARTRIDGE ----- SV803695- 1/SV803691-1 (1) | | SV803695/SV803691: 91: Entrained contamination in the inner and/or outer filter elements. | SV803695/SV803691: The radial flow filter design employs two coaxial cylindrical fitlers. The two coaxial 2 micron filter elements are made from sintered stainless steel (316ECL) to minimize corrosion. Each cylindrical filter element is welded to an Inconel 625 housing or sleeve. For further corrosion protection, the filter housing is made from Inconel 625 with O-seal grooves which contact Polypropylene sleeves. The Polypropylene sleeves separate the anodized aluminum bacteria filter element housing from the liquid. The total filter element area is 32.3 square inches to minimize clogging. | |
| | | | | B. Test - Component Acceptance: SV784959: A bubble point IPT is performed to insure correct filter size. Any major clogging could be found at this test as pressure at bubbling point would be greater than expected if the filter were clogged. A flow vs. delta P in process test is performed to verify a 0.33 psi max delta P at a flow rate of 30-35 pph with on inlet pressure of 11.5 + 0.5 psig. |
| | | | MISSION: Loss of use of one EMU. | |
| | | | CREW/VEHICLE: None. | |
| | | | TIME TO EFFECT /ACTIONS: Minutes. | SV803695/SV803691: A flow vs. delta P in process test is performed to verify a 0.15 psid max delta P at a flow rate of 13-15 pph for the inner filter and 18-20 pph for the outer filter with an inlet pressure of 11.5 + 0.5 psig. |
| | | | TIME AVAILABLE: Hours. | PDA Test: When the bacteria and particulate filters are installed and shipped in a SCU, Item 400, the pressure drop in the drain direction shall be 7.1 psid maximum at 30-35 pph flow. |
| | | | TIME REQUIRED: Minutes. | |
| | | | REDUNDANCY SCREENS: A-N/A B-N/A C-N/A | Certification: SV784959: Certified for a useful life of 10 EVA's max. SV803695/SV803691: Certified for a useful life of 36 EVA's max. |
| | | | | C. Inspection - SV784959: During assembly and processing of item, the filter cartridge screen is continuously protected from damage with a protective cover tool (SV784959-CT001). The cover aids by keeping the filter clean during welding and machining |

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| | | 424FM02 | | <p>(prevents entrapment of machining chips and weld spatter). A caution note is provided to teflon vendor to insure that the filter screen is protected from damage/contamination during teflon sandblasting and spray coating operations. The SV784959-CT001 protective cover tool is shipped with item to teflon vendor. Prior to in process testing, item is cleaned to HS3150 EM150. A Hamilton Standard MIP is on the op sheets at the above two mentioned component tests. Filters are recleaned to HS3150 EM150 prior to final packaging.</p> <p>SV803695/SV803691: Filters are cleaned to HS3150 EM150 prior to in-process testing and prior to final packaging.</p> <p>SV784959-1 and SV803695/SV803691:</p> <p>Final packaging for shipment maintains cleanliness level of EM150 and also prevents mechanical damage. During testing all rig lines and test fixtures are cleaned to HS3150 EM150 to prevent contamination from entering this filter.</p> <p>D. Failure History - SV784959 and SV803695/SV803691: None.</p> <p>E. Ground Turnaround - SV784959 and SV803695/SV803691: Tested per FEMU-R-001, Orbiter SCU Checkout.</p> <p>F. Operational Use - SV784959 and SV803695/SV803691: Crew Response - Post/PreEVA: Use working SCU to drain and fill EMU water tanks. Special Training - Standard EMU training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA.</p> |

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-424 POTABLE WATER FILTER
CRITICAL ITEM LIST (CIL)
EMU CONTRACT NO. NAS 9-97150

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