

**CRITICAL ITEM LIST**

08/31/90 SUPERSEDES 01/02/90

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| NAME<br>P/N<br>REV   | CRIT | FAILURE<br>MODE  | CAUSES  | FAILURE EFFECT   | ANALYSIS:<br>RATIONALE FOR ACCEPTANCE  |
|--|------|--|---|--|--|
| PRIMARY OXYGEN<br>BOTTLE, ITEM 101<br>Sv784099-2,<br>Sv784099-1<br>(2) | 2/30 | 1111HQ2;<br>internal gas<br>leakage.   |   | EMD (ITEM):<br>Oxygen leakage to<br>ambient.   | A. Design -<br>Sv770059, Sv784099-1;<br>Bottle to manifold sealing is accomplished by a radial<br>elastomeric O-seal. The silicon elastomeric seal design<br>configuration, dimension and rigidity of assembly provide<br>seal under all loading conditions.<br><br>B. Test -<br>Sv770059, Sv784099-1;<br>Component Acceptance Test -<br>The PBO bottle acceptance test procedure is specified in<br>SEM-7801 Table 1. Tests are performed by vendor and are as<br>follows:  |
|  |      | Failure due to<br>fitting sealing<br>surface damage<br>or seal material<br>defect. |   | GTE (INTERFACER):<br>Emissive<br>Consumption of the<br>primary oxygen<br>supply. The pop is<br>automatically<br>activated during<br>EMD if the bolt<br>pressure drops to<br>1.33 psid. | Part No. ....<br>Test<br>4.2.3 C Proof pressure and volumetric<br>expansion<br>4.2.3 D Helium leak test<br><br>POA Test - (Both types)<br>The Primary Oxygen Bottles are tested per SEMI-60-010. The<br>bottles are leak tested by pressurizing the bottles to<br>840-950 psia with a mixture of 90% Ar and 10% He. A helium<br>mass spectrometer is then used to "sniff" for evidence of<br>leakage from the bottles. At final inspection the item is<br>visually inspected for evidence of damage.<br><br>Certification test - SVPP8895:<br>Two units were subjected to operating pressure cycles of<br>54,000 (no failure) and 55,017 prior to failure. Two other<br>units completed 100 proof pressure cycles without failure<br>and then were burst tested to 3850 and 3160 psig. The burst<br>pressure requirement is 2100 psig. EC 41006-742 (prevent<br>unecessary proof cycles on oxygen bottles) has been<br>incorporated since that time. |
|  |      |  | CARRIER/VEHICLE:<br>None for single<br>failure. Possible<br>loss of crew with<br>loss of EDP. |  | Certification test - SV784099-1:<br>The Primary Oxygen Bottles are certified by the POA test per<br>SEMI-60-010. High pressure oxygen system leakage is checked<br>by POA prior to shipment. Also, when new "all metallic" tanks<br>were cycled the leakage was tested and showed no<br>discrepancies per ICA 3402 (SEMI-46-004B).   |

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| NAME<br>P/N<br>QTY          | CRIT | FAILURE<br>MODE &<br>CAUSES           | PRIORITE EFFECT | RATIONALE FOR ACCEPTANCE |
|-----------------------------|------|---------------------------------------|-----------------|--------------------------|
| PRIMARY<br>OXYGEN<br>BOTTLE | 2/3R | 110FM0281<br>EXTERNAL GAS<br>LEAKAGE. |                 |                          |
| ITEM 311<br>SV778896<br>121 |      |                                       |                 |                          |
| FC4-2<br>88                 |      |                                       |                 |                          |

## C. INSPECTION - (CONTINUED)

RADIOGRAPHIC INSPECTION IS PERFORMED TO DETECT CRACKS, VOIDS OR OTHER INTEGRITY PROBLEMS IN THE WELDS AND PARENT METAL OF TANK AS SPECIFIED IN SVRS 9430 PARA. 3.3.7 FRACTURE CONTROL. IN ADDITION, FLUORESCENT PENETRANT INSPECTION IS USED TO DETECT SURFACE DEFECTS IN THE WELDS AND PARENT METAL OF TANK AS SPECIFIED IN SVRS 9430, PARA. 3.3.7 FRACTURE CONTROL.

INSPECTION OF PROOF, LEAKAGE, RADIOGRAPHIC INSPECTION AND EXAMINATION OF INTERIOR SURFACES ARE PERFORMED AT YEARDON AND MONITORED BY MONTGOMERY STANDARD SOURCE INSPECTION.

D. FAILURE HISTORY -  
NONE.E. GROUND TURNAROUND -  
LISTED PER FLMR-R-001, CHAMBER MIN CHECKOUT OF 02 BOTTLE CIRCUIT LEAKAGE.

F. OPERATION USE -  
CREW RESPONSE -  
PREEVA: WHICH DETECTED PRIOR TO PRIMARY OR TANK TOPOFF, TROUBLE SHOOT PROBLEM, IF NO SUCCESS, CONSIDER THIS 3 IF AVAILABLE, EVA AND DO FOR EVA.  
EVA: WHEN THE DATA CONIFERS AN ACCELERATED PRIMARY OR USE RATE, TERMINATE EVA.  
TRAINING - STANDARD EVA TRAINING COVERS THIS FAILURE MODE.

OPERATIONAL CONSIDERATIONS - FLIGHT RULES DEFINE REQUIRE EVA TERMINATION WHEN MINIMUM PROPANE CONSUMABLES REMAIN.

EVA CHECKLIST PROCEDURES VERIFY HARDWARE INTEGRITY AND SYSTEMS OPERATIONAL STATUS PRIOR TO EVA.  
REAL TIME DATA SYSTEM ALLOWS GROUND MONITORING OF THIS SYSTEMS.

REF ID: A64247

CCL  
CRITICAL ITEMS LIST  
FILE: CCL-PLSS/2

| NAME                  | P/N  | CAUSE                           | FAILURE EFFECT | RATIONALE FOR ACCEPTANCE  |
|-----------------------|------|---------------------------------|----------------|---|
| PRIMARY OXYGEN BOTTLE | 2/12 | 1) ENDOD; EXTERNAL GAS LEAKAGE. |                | D. FAILURE HISTORY - NONE.  |
| ITEM 121 SU786059-1   |      |                                 |                | E. GROUND TRIMMABILITY - TESTED PER FEMI-R-001, CHAMBER RUN CHECKOUT OF 02 BOTTLE CIRCUIT LEAKAGE.  |
| PC4A-2                |      |                                 |                | F. OPERATION EFFECTS - CREW RESPONSE - FREEVA: WHEN DETECTED PRIOR TO PRIMARY OR TANK TORPOFF, DOUBLE SHOOT PROBLEM, IF NO SUCCESS, CONSIDER EHU 1 IF AVAILABLE. EHU NO GO FOR EVA. EVAL: WHEN CMS DATA CONFIRMS AN ACCELERATED PRIMARY O2 USE RATE, TERMINATE EVA. TRAINING - STANDARD EHM TRAINING COVERS THIS FAILURE MODE. OPERATIONAL CONSIDERATIONS - FLIGHT RULES DEFINE REQUIRE EVA TERMINATION WHEN MINIMUM PRIMARY CONSUMABLES REMAIN. EVA CHECKLIST PROCEDURES VERIFY HARDWARE INTEGRITY AND SYSTEMS OPERATIONAL STATUS PRIOR TO EVA. REAL TIME DATA SYSTEM ALLOWS GROUND MONITORING OF EHU SYSTEMS. |
| 01                    |      |                                 |                |   |