

ASSY NOMENCLATURE OXYGEN CYLINDER  
 ASSY P/N. C4285

SYSTEM: CREW ESCAPE SYSTEM  
 SUBSYSTEM: EMERGENCY OXYGEN SYSTEM

REVISION: A  
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# CRITICAL ITEMS LIST

FMEA		NAME, QTY & DRAWING REF DESIGNATION	CRTY	FAILURE MODE AND CAUSE	FAILURE EFFECT OR PROB	RATIONALE FOR ACCEPTANCE
REF	REV					
512		OXYGEN CYLINDER, (2) C4285	UI	Mode: External leakage  Cause: • Defective seal • Defective material	Loss of available oxygen in one or both oxygen cylinders	<ol style="list-style-type: none"> <li>1. Design Features.               <ol style="list-style-type: none"> <li>a. MIL-1-27730 Teflon tape is applied to male pipe thread on the reducer</li> <li>b. The cylinders are designed and fabricated to MIL-STD-1522A, 3/8 inch - 18 npt internal thread class 2 - 3000 psi construction and nonshatterable, leak before-burst</li> <li>c. The material is CRE5 cryoformed 301</li> <li>d. The cylinder wall thickness is .032 inches minimum</li> <li>e. Cylinders will be certified in accordance with MIL-STD-1522A pressure vessel</li> <li>f. The cylinders are cryostretched in which an end closure in the finished cylinder has been welded</li> </ol> </li> <li>2. Test or Analysis to Detect Failure Mode.               <ol style="list-style-type: none"> <li>a. <u>Acceptance Test</u> <ol style="list-style-type: none"> <li>(1) The material is certified by the supplier by physical/chemical tests run on CRE5 cryoformed 301</li> <li>(2) The cryostretched cylinders are verified to be in conformance to MIL-STD-1522A</li> <li>(3) The cylinders are subjected to permanent volumetric expansion hydrostatic test. The permanent volumetric expansion must not exceed .6 percent of the total volumetric expansion</li> <li>(4) The cylinders are leak tested at 3000 psi for at least 1 minute with helium. Leakage shall not exceed 1 x 10<sup>-6</sup> scf/sec</li> <li>(5) Functional test at 30 slpm for 10 minutes minimum at 20 ± 10 psig. After 10 minutes flow is increased to 90 slpm until gauge reads empty</li> <li>(6) All cylinders are proof tested to 4500 psi</li> </ol> </li> </ol> </li> </ol>

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FMEA		NAME, QTY & DRAWING REF DESIGNATION	QNTY	FAILURE MODE AND CAUSE	FAILURE EFFECT OR END ITEM	RATIONALE FOR ACCEPTANCE
REF	REV					
512		OXYGEN CYLINDER, (2) C4285	21	Mode: External leakage  Cause: • Defective seal • Defective material	Loss of available oxygen in one or both oxygen cylinders	<p>(7) All cylinders are subjected to a 3000 psi high-pressure system leak test for 24 hours and 250 psi low pressure system leak test for 24 hours</p> <p>(8) All cylinders receive penetrant and x-ray inspection to detect surface cracks and voids in the welds</p> <p>(9) Oxygen purity test on all cylinders using 99.95 percent oxygen. The oxygen in the cylinders is not less than 99.5 percent</p> <p><b>d. Certification</b></p> <p>(1) The cylinders are qualified in accordance with MIL-STD-1522A</p> <p>(2) Burst pressure tested, hydrostatically for 1 minute at 6000 psi, then tested to destruction</p> <p>(3) Cycle tested, hydrostatically charged to 3000 psi and pressure released to obtain an internal pressure equal to ambient atmospheric pressure for 1000 cycles. This procedure is repeated at 4500 psi for 4 cycles</p> <p>(4) The cylinder is leak tested at 3000 psi for 1 minute with helium. The leakage rate shall not exceed 1 x 10<sup>-6</sup> cc/sec.</p> <p>(5) A similar system was live jumped at the Naval Weapons Center: 12 jumps from 25,000 feet, 4 jumps for 17,000 feet, 12 jumps from 10,000 feet, and 8 water drop jumps</p> <p><u>Turnaround Testing</u> (In accordance with PIA 23029)</p> <p>a. System test, 3000 psi high-pressure system leakage test for 24 hours</p> <p>b. Proof pressure tested at 4500 psi every 4 years</p>

EXPEDITE PROCESSING

PREPARED BY: R. L. Allison / W. Sauser

SUPERSEDING DATE: 10/24/88

APPROVED BY: J.O. Schaefer

DATE: 5/1/89

CEE/EOS-8

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FMEA		NAME, QTY & DRAWING REF DESIGNATION	QTY	FAILURE MODE AND CAUSE	FAILURE EFFECT OR END ITEM	RATIONALE FOR ACCEPTANCE
REF	REV					
512		OXYGEN CYLINDER, (2) C4285	1/1	Mode: External leakage  Cause: • Defective seal • Defective material	Loss of available oxygen in one or both oxygen cylinders	<ol style="list-style-type: none"> <li>3. Inspection.               <ol style="list-style-type: none"> <li>a. 100 percent OCAS inspection</li> <li>b. Dimensional inspection after permanent volumetric expansion after hydrostatic testing</li> <li>c. Cylinders are examined for cleanliness, level 100A in accordance with JSCM 5322, Contamination Control Plan</li> <li>d. Cylinders are visually inspected for conformance to the configuration of type specified, internal cleanliness, finish, color, markings</li> <li>e. Verification of test report</li> </ol> </li> <li>Turnaround Inspection (in accordance with PIA 23029)               <ol style="list-style-type: none"> <li>a. Cylinders are examined for cleanliness, level 100A</li> <li>b. Cylinders are visually inspected.</li> <li>c. Verify pressure gauge is not empty</li> <li>d. Packing inspection after installed in parachute harness.</li> </ol> </li> <li>4. Failure History. None. The oxygen cylinder is a new configuration</li> <li>5. Operational Use.               <ol style="list-style-type: none"> <li>a. Operational effect of failure: Possible loss of crewmember</li> <li>b. Crew action: None</li> <li>c. Crew training: The crew is trained in the proper use of the emergency O<sub>2</sub> system</li> <li>d. Mission constraints: None. Mission is terminated prior to use of this equipment</li> <li>e. In flight check-out: The crew could inspect the O<sub>2</sub> bottles during flight, but cannot repair or replace defective O<sub>2</sub> bottles</li> </ol> </li> </ol>

EXPEDITE  
 PROCESSING