

ASSY NOMENCLATURE: REDUCER ASSEMBLY

SYSTEM CREWESCAPE SYSTEM

REVISION A

CRITICAL ITEMS LIST

ASSY P/N: 8825071

SUBSYSTEM EMERGENCY OXYGEN SYSTEM

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FMEA		NAME, QTY & DRAWING REF DESIGNATION	CRITY	FAILURE MODE AND CAUSE	FAILURE EFFECT OR ENCIEM	RATIONALE FOR ACCEPTANCE
REF	REV					
541		REDUCER/BELIEF VALVE, (2) 8825071	U1	<p>Mode: Reducer or relief valve fails open</p> <p>Cause: • Contamination • Piece part failure • Defective material</p>	Excessive consumption of EOS supply	<p>1. Design Features to Minimize Failure.</p> <ul style="list-style-type: none"> a. Inlet pressure 200 - 3000 psig b. Demand breathing system 70 ± psig c. Seat is made of batch controlled vespet 5P-21 d. Ball is made of 304 CRES e. Filter is "microwave" wire mesh (304 CRES), 20 micron f. Retainer spring is CRES 17-7 PH, outer diameter 230- 240, wire diameter: .015, spring constant 32.25 lb/in Diaphragm spring is CRES 17-7 PH, outer diameter 545, wire diameter 160, spring constant 424 lb/in ± 36 lb/in g. Relief valve: 40 lpm @ 140 psig maximum Reset pressure 110 psig minimum Crack pressure 120 psig nom /140 psig maximum h. Diaphragm is 1.1" diameter, daccron 150041 impregnated with Dow Corning Silicone Rubber #DC350 Thickness - .026 ± .003 i. Operating temperature 0° to 160°F <p>2. Test or Analysis to Detect Failure Mode.</p> <ul style="list-style-type: none"> a. <u>Acceptance Test</u> <ul style="list-style-type: none"> (1) The material is certified by the supplier by physical/chemical tests run on 304 CRES (2) Subjected to 3000 psi high pressure and 250 psi low pressure system leak test for 24 hours

SUPERSEDING DATE 10/24/88

APPROVED:

CEE/EOS-15

DATE 5/2/89

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SYSTEM: CREW ESCAPE SYSTEM

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ASSY P/N: 8825871

SUBSYSTEM: EMERGENCY OXYGEN SYSTEM

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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					
541		REDUCER/RELIEF VALVE, (2) 8825871	1/1	Mode: Reducer or relief valve fails open Cause: • Contamination • Piece part failure • Defective material	Excessive consumption of EOS supply	(3) Proof load between ball terminals. 120.0 pound for 5 seconds. (4) Leakage test on relief valve/biller valve prior to reducer assembly (5) Seat leakage test, body leakage test, and cam actuation test, pressurized to 3000 psig for 15 minutes (6) Outlet flow and pressure test. 40-90 lpm, 70 psig ± 5 psig (7) Relief valve cracking pressure test between 140 ± 10 psig at 3000 psig ± 100.0 psig (8) Functional test at 70 slpm for 10 minutes minimum at 70 ± 10 psig. After 10 minutes, flow is increased to 90 slpm until gauge reads empty. (9) Halogen purity test. flow oxygen to verify minimum purity of 95 percent b. Certification (1) A similar reducer is qualified in accordance with Rockwell International procurement specification B 1 instructor bailout emergency oxygen assembly (2) Proof pressure tested to 4500 psig ± 100.0 psig (3) Burst pressure tested to 7500 psig ± 100.0 psig for 1 minute (4) Endurance cycling. The inlet pressure is varied from 3000 psig to 250 psig and returned to 3000 psig. This process is repeated for 250 cycles (5) O ₂ material compatibility test. Inlet pressure varied from 3750 psig to 250 psig and returned to 3750 psig. Process repeated 100 cycles (6) 3750 psig leak tested. No leakage is allowed

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SUBSYSTEM EMERGENCY OXYGEN SYSTEM

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FMEA		NAME, QTY & DRAWING REF DESIGNATION	CNTY	FAILURE MODE AND CAUSE	FAILURE EFFECT OR IMPACT	RATIONALE FOR ACCEPTANCE
REF	REV					
S41		REDUCER/RELIEF VALVE, (2) 8825071	1/1	<p>Mode: Reducer or relief valve fails open</p> <p>Cause: <ul style="list-style-type: none"> • Contamination • Piece part failure • Defective material </p>	Excessive consumption of EO2 supply	<p>(6) A similar system was live jumped at the Naval Weapons Center 12 jumps from 25,000 feet, 4 jumps from 12,000 feet, 12 jumps from 10,000 feet, and 8 water drop jumps</p> <p><u>Turnaround Testing</u> (in accordance with PIA 23029)</p> <ol style="list-style-type: none"> a. Internal/external leak check at 3000 psig ± 100 - 0 psig b. 24-hour leak/decay check at 3000 psig ± 100 - 0 psig c. Pool pressure test to 4500 ps ± 100 - 0 psig every 4 years <p>3. Inspection.</p> <ol style="list-style-type: none"> a. 100 percent DCA5 inspection on all parts. b. Cleaned and inspected for cleanliness to Level 100A in accordance with ISCM 5322, Contamination Control Plan. c. Black light test - inspected for external contamination d. After reducer is assembled, the reducer is x-ray inspected to verify all parts and proper assembly e. Visual inspection to conformance of drawings f. All moving parts are examined to ensure that they operate freely without sticking or binding

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FMEA		NAME, QTY & DRAWING REF DESIGNATION	QNTY	FAILURE MODE AND CAUSE	FAILURE EFFECT OR ENG ITEM	RATIONALE FOR ACCEPTANCE
REF	REV					
541		REDUCER/RELIEF VALVE, (2) 8825071	111	<p>Mode: Reducer or relief valve fails open</p> <p>Cause: <ul style="list-style-type: none"> • Contamination • Piece part failure • Defective material </p>	Excessive consumption of EOS supply	<p><u>Required Inspection</u> (In accordance with PIA 23029)</p> <ul style="list-style-type: none"> a. Verify reducers are not activated b. Visual inspection for damage c. Verify clean and inspected to cleanliness level 100A <p>A. Failure History: None. A similar reducer is used in the B-1 bailout system and Dryden Flight Research Center</p> <p>S. Operational Use:</p> <ul style="list-style-type: none"> a. Operational effect of failure: Possible loss of crewmember b. Crew action: None c. Crew Training: The crews trained in the proper use of the emergency O₂ system d. Mission constraints: None. Mission would be terminated prior to use of this equipment e. In-flight checkout: None. Visual inspection of reducer/relief valve prior to use would not reveal failure

PREPARED BY: R. AINSWORTH Sawyer

SUPERSEDING DATE: 10/24/88

APPROVED BY: J.O. Schuster

DATE: 5/2/89

CEE/EOS-18