

# CRITICAL ITEMS LIST

Reference Designer:  
Name/Quantity: Exhalation Valve  
Drawing Reference: 555066

Project: Quick Don Mask Assy.  
LRU Name/Quantity: QDMA  
LRU Part Number: SE03310452B-303

Subsystem: CEE  
Effectivity: ALL ORBITERS

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Failure Mode Number QDMA-FM-004	Critically 1R/2	Failure Effect	Retention Rationale
<b>Function</b> Allows exhaled gases to pass from facial cavity to ambient.		<b>End Item</b> Unable to maintain positive mask pressure and excessive consumption of oxygen. Regulator free flow	1. DESIGN FEATURES TO MINIMIZE FAILURE MODE A. A stainless steel 20 micron screen filter is incorporated into the inlet port to prevent contamination. B. The expiratory diaphragm and packings are fabricated of silastic silicone rubber with a minimum age life of 6 years. C. Regulator designed to withstand a minimum of 250,000 cycles with a peak breathing rate of 30 l/min. for 200,000 cycles and 70 l/min. for 50,000 cycles.  2. TEST OR ANALYSIS TO DETECT FAILURE MODE A. Acceptance Test (1) Safety pressure test at 60, 70 and 110 psig inlet pressure and 70 slpm flow. Specification: 0.1 to 1.0 in. H <sub>2</sub> O. (2) Normal outward leakage test. Specification: less than 0.1 l/min. (3) Emergency outward leakage test. Specification: less than 1.0 l/min. (4) Exhalation valve resistance test at 20 slpm flow. Specification: 0 to 1.5 in. H <sub>2</sub> O. Exhalation valve resistance test at 100 slpm flow. Specification: Less than 3.0 in. H <sub>2</sub> O.  B. Certification (1) Certification in accordance with TSO-C89, FAA Technical Standard Order, Protective Breathing Equipment. (2) Subjected to temperatures of 160° F for 12 hours and -67° F for 2 hours after which a complete functional test is performed. (3) Cycle tested 250,000 cycles with a peak breathing rate of 30 slpm for 200,000 cycles and 70 l/min. for 50,000 cycles. Complete functional test performed after cycling.
<b>Failure Mode and Cause</b> Leakage/Fails Open  <b>Cause:</b> 1. Defective valve material 2. Contamination		<b>Mission</b>  None	
<b>Redundancy</b> Screens   Remaining Paths Requires previous single point Orbiter failure.  A-P B-N/A C-P		<b>Crew/Vehicle</b> Possible loss of crewmember due to inability of mask to maintain positive pressure in free flow condition.	
<b>Mission Phase</b>   <b>Time to Effect</b>   <b>Time to Correct</b> Orbiter Emergency   Seconds   N/A		<b>Interface</b> Excessive PPO <sub>2</sub> in cabin.	

# CRITICAL ITEMS LIST

Reference Designator:  
 Name/Quantity: Exhalation Valve  
 Drawing Reference: 555088

Project: Quick Don Mask Assy.  
 LRU Name/Quantity: QDMA  
 LRU Part Number: SED33104528-303

Subsystem: CEE  
 Effectivity: ALL ORBITERS

Failure Mode Number QDMA-FM-004	Criticality 1R/2	Failure Effect	Retention Rationale
<b>Function</b> Allows exhaled gases to pass from facial cavity to ambient.		<b>End Item</b> Unable to maintain positive mask pressure and excessive consumption of oxygen. Regulator free flow	<b>C. Turnaround Testing (per PDA/PIA procedure)</b> (1) Complete PDA testing performed every 24 months or before every flight. Testing includes positive pressure, outward leakage and exhalation valve resistance tests. (2) Replacement of regulator softgoods and overhaul every 6 years. Complete PDA testing after overhaul. <b>3. INSPECTION</b> <b>A. Manufacturing</b> (1) Verify all materials, parts and assembly processes meet requirements. (2) Visual inspection of parts for defects (3) Verify all internal parts cleaned for oxygen service level 100C per JSCM 5322. (4) Verify replacement of regulator softgoods, assembly overhaul every 6 years. (5) Verify internal parts of regulator cleaned for oxygen service per JSCM 5322, level 100G; external system cleanliness level GC per JSCM 5322.
<b>Failure Mode and Cause</b> Leakage/Fails Open <b>Cause:</b> 1. Defective valve material 2. Contamination		<b>Mission</b> None	
<b>Redundancy Screens</b> A - P B - N/A C - P		<b>Crew/Vehicle</b> Possible loss of crewmember due to inability of mask to maintain positive pressure in free flow condition.	
<b>Remaining Paths</b> Requires previous single point Orbiter failure.		<b>Interface</b> Excessive PPO <sub>2</sub> in cabin.	
<b>Mission Phase</b> Orbiter Emergency	<b>Time to Effect</b> Seconds	<b>Time to Correct</b> N/A	

DATE: 4/92 REVISION: BASIC

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# CRITICAL ITEMS LIST

Reference Designator:  
Name/Quantity: Exhaustion Valve  
Drawing Reference: 555066

Project: Quick Don Mask Assy.  
LRU Name/Quantity: QDMA  
LRU Part Number: SED33104528-303

Subsystem: CEE  
Effectivity: ALL ORBITERS

Failure Mode Number QDMA-FM-004	Criticality 1R/2	Failure Effect	Retention Rationale
<b>Function</b>  Allows exhaled gases to pass from facial cavity to ambient.		<b>End Item</b> Unable to maintain positive mask pressure and excessive consumption of oxygen. Regulator free flow	<b>4. FAILURE HISTORY</b>  This regulator/mask is used in commercial applications (Grumman Gulfstream, Boeing 747-400) and military applications (C-130), no service failures reported.  <b>5. OPERATIONAL USE</b>  A. Operational effect or failure: Potential loss of crewmember due to inability of mask to maintain positive pressure in free flow condition.  B. Crew action: Crew could inspect valve and attempt to clear any visual contamination. Crew could not replace or repair defective valve.  C. Crew training: Crew is trained in correct function and use of QDMA.  D. Mission constraint: None.  E. Inflight checkout: None.
<b>Failure Mode and Cause</b>  Leakage/Falls Open  <b>Cause:</b>  1. Defective valve material 2. Contamination		<b>Mission</b>  None  <b>Crew/Vehicle</b> Possible loss of crewmember due to inability of mask to maintain positive pressure in free flow condition.	
<b>Redundancy Screens</b>  A-P B-N/A C-P	<b>Remaining Paths</b> Requires previous single point Orbiter failure.	<b>Interface</b> Excessive PPO <sub>2</sub> in cabin.	
<b>Mission Phase</b>	<b>Time to Effect</b>	<b>Time to Correct</b>	
<b>Orbiter Emergency</b>	<b>Seconds</b>	N/A	