CRITICAL ITEMS LIST

REFERENCE DESIGNATOR:
NAME/QUANTITY: Exhalation Valve/1
DRAWING REFERENCE: 6020-1074-01 (-301), ON-01833-5 or F1833-5 (-303, -305)

PROJECT Emergency Oxygen Mask Assy
LRU NAME/QUANTITY: EOMA
LRU PART NUMBER: SDD91108375-301, -303, -305

SUBSYSTEM:
EFFECTIVITY All Orbiters

FAILURE MODE NUMBER EOMA-FM-005	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE

FUNCTION

Allows exhaled gases to pass from facial cavity to ambient.

FAILURE MODE AND CAUSE

Fails Closed

Cause:

1. Defective valve
2. Contamination

REDUNDANCY SCREENS	REMAINING PATHS
A – P B – N/A C – P	Requires previous single point Orbiter failure.

MISSION PHASE	TIME TO EFFECT	TIME TO CORRECT
Orbiter Emergency	Seconds	N/A

END ITEM

CO_2 buildup in facial cavity.

MISSION

None

CREW/VEHICLE

Possible loss of crewmember due to loss of oxygen/CO_2 buildup in facial cavity.

INTERFACE

None.

RETENTION RATIONALE

1. DESIGN FEATURES TO MINIMIZE FAILURE MODE

   (-301)

   A. Seat made of polymide material.
   B. The valve opens at 1.65 +/- .15 in water at a minimum flow of 20cc/min.
   C. Resistance at flows of 200 cc/min, 1.25 to 1.75 in. water and 100 slpm 3.0 in water maximum.

   (-303,-305)

   A. The exhalation valve is in current by the Air Force.
   B. The valve is a mica disc.
   C. The case and seat is aluminum.
   D. The spring is phosphor bronze under calibrated compression
   E. The valve opens at 1.65 ± 0.15 inches H_2O minimum input flow which shall not exceed 25/cc minute.
   F. Resistance at flows of 0 to 95 slpm, 3.0 inches H_2O maximum; 0 to 2 slpm 0.3 inch H_2O maximum above pressure setting

2. TEST OR ANALYSIS TO DETECT FAILURE MODE

   (-301)

   A. Acceptance Testing

      Exhalation valve resistance test. 1.5 +/- .25 in/water at 200 SCC/min. not to exceed 3.0 in./water at a flow of 100 liters/min per PDA/PIA JSC 22130.

   B. Certification

      (1) Valve was certified for use in the launch entry helmet.

      (2) Exhalation valve resistance test 1.5 +/- .25 in./water at 200 SCC/min. not to exceed 3.0 in./water at a flow of 100 liters/min.

   C. Turnaround Testing (Per PDA/PIA JSC 22130)

      Exhalation valve resistance test per PIA JSC 22130 same as PDA.

PREPARED BY:

REVISION:

SUPERSEDING DATE:

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR
NAME/QUANTITY: Exhalation Valve/1
DRAWING REFERENCE: G020-1074-01 (-301), DN-01833-5 or F1833-5 (-303, -305)

PROJECT: Emergency Oxygen Mask Assy
LRU NAME/QUANTITY: EOMA
LRU PART NUMBER: SDDT1100275-301, -303, -305

SUBSYSTEM:
EFFECTIVITY: All Orbiters

FAILURE MODE NUMBER EOMA-FM-005	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE

FUNCTION

Allows exhaled gases to pass from facial cavity to ambient.

FAILURE MODE AND CAUSE

Fails Closed

Cause:

1. Defective valve
2. Contamination

REDUNDANCY SCREENS

A – P
B – N/A
C – P

REMAINING PATHS

Requires previous single point Orbiter failure

MISSION PHASE	TIME TO EFFECT	TIME TO CORRECT
Orbiter Emergency	Seconds	N/A

END ITEM

CO_2 buildup in facial cavity.

MISSION

None.

CREW/VEHICLE

Possible loss of crewmember due to loss of oxygen/CO_2 buildup in facial cavity.

INTERFACE

None.

RETENTION RATIONALE

2. TEST OR ANALYSIS TO DETECT FAILURE MODE (Continued)

(-303, -305)

A. Acceptance Testing

(1) Flow of 25/cc minute, at 70 psig - back pressure should read 1.65 ± 0.15 inches H_2O

(2) Flow of 2 slpm at 70 psig - back pressure should not increase more than 0.3 inch H_2O

(3) Flow of 95 slpm, at 70 psig - back pressue should be less than 3.0 inches H_2O

B. Certification

(1) This exhalation valve was certified by its use in the Air Force S1030, S103 and NASA launch/entry pressure suit systems. The exhalation valve has been in use for over 25 years.

(2) Exhalation Valve Resistance Test s: 1.65 ± .15 in of H_2O at 25 SCCM, 1.95 ± .15 in of H_2O at 200 SCCM, and less than 3.4 in H_2O at 95 slpm

C. Turnaround Test

(1) Flow of 25/cc minute, at 70 psig - back pressure shold read 1.65 ± 0.15 inches H_2O.

(2) Flow of 2 slpm, at 70 psig - back pressure should not increase more than 0.3 inch H_2O.

(3) Flow of 95 slpm, at 70 psig - back pressure should be less than 3.0 inches H_2O.

3. INSPECTION

(-301)

A. Manufacturing

(1) 100% inspection of material defects and fabrication requirements.

(2) Visual cleanliness inspecton.

B. Turnaround Inspection

(1) Verify functional test per PIA JSC 22130

(2) Visual cleanliness inspection per JSCM 5322, level GC.

PREPARED BY: REVISION: SUPERSEDING DATE: DATE:

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR:
NAME/QUANTITY: *Exhalation Valve/1*
DRAWING REFERENCE: *G830-1074-01 (-301), OM-01833-5 or F7833-5. (-303, -305)*

PROJECT: *Emergency Oxygen Mask Assy*
LRU NAME/QUANTITY: *EOMA*
LRU PART NUMBER: *SOD1T100275-301, -303, -305*

SUBSYSTEM:
EFFECTIVITY: *All Orbiters*

FAILURE MODE NUMBER EOMA-FM-005	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE

FUNCTION

Allows exhaled gases to pass from facial cavity to ambient.

FAILURE MODE AND CAUSE

Fails Closed

Cause:

1. Defective valve
2. Contamination

REDUNDANCY SCREENS	REMAINING PATHS
A – P B – N/A C – P	Requires prewous single point Orbiter failure.

MISSION PHASE	TIME TO EFFECT	TIME TO CORRECT
Orbiter Emergency	Seconds	N/A

END ITEM

CO_2 buildup in facial cavity.

MISSION

None

CREW/VEHICLE

Possible loss of crewmember due to loss of oxygen/CO_2 buildup in facial cavity.

INTERFACE

None.

3. INSPECTION (Continued)

(-303, -305)

A. Manufacturing.
   (1) Visual inspection of parts for defects.
   (2) One hundred percent visual inspection during assembly
   (3) Visual inspection on glyptal seal for defect.
   (4) Visual inspection for contamination
   (5) Verify flows are within specifications of the acceptance test
B. Turnaround inspection.
   (1) Visual inspection of parts for defects.
   (2) One hundred percent visual inspection during assembly.
   (3) Visual inspection on glyptal seal for defect.
   (4) Visual inspection for contamination.
   (5) Verify flows are within specifications of the acceptance test
   (6) Verify exhalation valve is cleaned to level 300 in accordance with JSCM 5322

4. FAILURE HISTORY

(-301)

No known failures in this or similar programs.

(-303, -305)

None.

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CRITICAL ITEMS LIST

REFERENCE DESIGNATOR:
NAME/QUANTITY: Exhalation Valve/F
DRAWING REFERENCE: G620-4474-01 (-301), DN-D1833-5 or F1833-5 (-302, -305)

PROJECT: Emergency Oxygen Mask Assy
LRU NAME/QUANTITY: EOMA
LRU PART NUMBER: SOQ1T100275-301, -302, -305

SUBSYSTEM:
EFFECTIVITY: All Orbiters

FAILURE MODE NUMBER EOMA-FM-005	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE
FUNCTION Allows exhaled gases to pass from facial cavity to ambient.		**END ITEM** CO_2 buildup in facial cavity.	S. OPERATIONAL USE (-301, -302, -305) A. Operational effects of failure potential loss of crewmember due to CO_2 buildup in facial cavity and/or contaminated atmosphere B. Crew Action: Crew could inspect valve and attempt to clear any contamination. Could not repair or replace defective valve. C. Crew Training: Crew will receive this training D. Mission constraint: None E. In-flight checkout: None
FAILURE MODE AND CAUSE Fails Closed Cause: 1. Defective valve 2. Contamination		**MISSION** None **CREW/VEHICLE** Possible loss of crewmember due to loss of oxygen/CO_2 buildup in facial cavity. **INTERFACE** None.	
REDUNDANCY SCREENS A – P B – N/A C – P	*REMAINING PATHS* *Requires previous single point Orbiter failure*		
MISSION PHASE	**TIME TO EFFECT**	**TIME TO CORRECT**	
Orbiter Emergency	Seconds	N/A	

PREPARED BY: REVISION: SUPERSEDING DATE: DATE: