

## SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : CREW MODULE SEALS FMEA NO 01-4 -CS47 -1 REV: 03/29/81

ASSEMBLY : SIDE HATCH/CABIN FILL TEST PORT CRIT. FUNC: 11  
 P/N RI : CRIT. HDW: :  
 P/N VENDOR: NAS1598C30Y VEHICLE 102 103 104  
 : MS9068-140 EFFECTIVITY: X X X  
 QUANTITY : 2 PHASE(S): PL LO X OO X DO X LS  
 : 1 EACH P/N

## PREPARED BY:

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## REDUNDANCY SCREEN:

## APPROVED BY:

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A-FAIL B-FAIL C-PAS

## APPROVED BY (NASA):

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## ITEM:

SEALS, SIDE HATCH CABIN FILL TEST PORT

## FUNCTION:

THESE SEALS PREVENT LEAKAGE OF CREW MODULE ATMOSPHERE.

## FAILURE MODE:

LEAKAGE

## CAUSE(S):

CRACKS, LOW TEMPERATURE, MATERIAL DEGRADATION

## EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) FAILURE OF SINGLE SEAL HAS NO EFFECT. LOSS OF REDUNDANT SEAL WOULD RESULT IN THE LOSS OF CREW MODULE CONSUMABLES.

(B) FAILURE OF A SINGLE SEAL HAS NO EFFECT. LOSS OF REDUNDANT SEAL WOULD RESULT IN THE LOSS OF CREW MODULE CONSUMABLES.

(C) FAILURE OF A SINGLE SEAL HAS NO EFFECT. LOSS OF THE REDUNDANT SEAL WOULD RESULT IN LOSS OF CREW MODULE CONSUMABLES, HOWEVER, THIS WOULD NOT EXCEED THE MAKEUP CAPABILITY OF THE ARPCS BUT WOULD POSSIBLY RESULT IN EARLY TERMINATION OF MISSION.

(D) FAILURE OF SINGLE SEAL HAS NO EFFECT. LOSS OF THE REDUNDANT SEAL AND AN ADDITIONAL SEAL FAILURE WITHIN THE CREW MODULE COULD RESULT IN A LEAK RATE EXCEEDING THE ARPCS MAKEUP CAPABILITY RESULTING IN LOSS OF CREW/VEHICLE.

REDUNDANCY SCREENS: SEAL FAILS SCREENS "A" AND "B" BECAUSE LEAK TEST OF EACH SEAL INDIVIDUALLY IS NOT FEASIBLE.

## DISPOSITION &amp; RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

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SUBSYSTEM : CREW MODULE SEALS

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REV:03/29/88

**(A) DESIGN**

CABIN FILL TEST PORT FITTING CLAMP RING/NUT COMPRESSES THE SEALS AND ENSURES UNIFORM COMPRESSION AROUND THE SEALS PERIPHERY, WITH METAL TO METAL CONTACT AT SEALED INTERFACES. EITHER SEAL CAN PREVENT LEAKAGE. O-RING SEAL IS SILICONE RUBBER AND CLAMP RING/NUT GASKET SEAL IS SYNTHETIC RUBBER.

**(B) TEST**

ACCEPTANCE TESTS: PROOF PRESSURE TEST OF HATCH TO 17.7 +0.1 -0.0 PSID FOR 2.0 +/- 1.0 MINUTES IS PERFORMED PER MLO206-0016 IN MANUFACTURING TEST FIXTURE. HATCH SEALS ARE VERIFIED IN MANUFACTURING PRESSURE TESTS OF CREW MODULE TO 14.7 PSID AND LEAK TEST TO 3.2 PSID.

QUALIFICATION TESTS: QUALIFICATION TESTS WERE NOT PERFORMED CERTIFICATION IS BASED ON ACCEPTANCE TESTS AND SEAL MATERIALS DATA.

OMRSD: GROUND TURNAROUND INCLUDES PRE-LIFTOFF PRESSURIZATION TEST AT 2 PSID; HOWEVER, IT IS UNLIKELY TO DETECT DUAL SEAL LEAKAGE.

**(C) INSPECTION**

**RECEIVING INSPECTION**

RECEIVING INSPECTORS EXAMINE SEALS FOR DAMAGE AND FOR QUALITY OF WORKMANSHIP. THEY ALSO VERIFY THAT SUPPLIER SUBMITTED THE REQUIRED REPORTS.

**CONTAMINATION CONTROL**

RECEIVING INSPECTORS VISUALLY EXAMINE SEALS FOR ADHERENCE TO CLEANLINESS REQUIREMENTS. INSPECTORS ALSO VERIFY, PRIOR TO INSTALLATION, THAT THE SEAL AND SEALING SURFACE MEET THE CLEANLINESS REQUIREMENTS PER MAO106-328.

**ASSEMBLY/INSTALLATION**

THE SEALS ARE INSTALLED PER MAO106-328. INSPECTORS VERIFY THAT THE SEAL AND THE SEALING SURFACE ARE NOT DAMAGED BEFORE INSTALLATION.

**TESTING**

THE INSPECTORS VERIFY THE ACCEPTANCE TEST.

**HANDLING/PACKAGING**

THE RECEIVING INSPECTORS VERIFY THAT EACH SEAL IS PACKAGED SO AS TO PRECLUDE DAMAGE HANDLING AND STORAGE.

**(D) FAILURE HISTORY**

THERE HAVE BEEN NO ACCEPTANCE TEST, QUALIFICATION TEST, FIELD OR FLIGHT FAILURES ASSOCIATED WITH THIS FAILURE MODE.

**(E) OPERATIONAL USE**

NO ACTION REQUIRED FOR SINGLE SEAL FAILURE. IF DUAL SEAL FAILURES OCCUR LOSS OF CREW MODULE CONSUMABLES CAN BE MONITORED AND ASSESSED FOR FEASIBILITY OF CONTINUING THE MISSION PER CABIN LEAK PROCEDURES AND FLIGHT RULES.