SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :CREW MODULE SEALS   FMEA NO 01-4 -CS29 -1   REV:03/29/8

ASSEMBLY :SIDE HATCH TUNNEL   CRIT. FUNC: 1
P/N RI :V070-338634-001,-002   CRIT. HDW:
P/N VENDOR: VEHICLE: 102 103 104
QUANTITY :2   EFFECTIVITY: X X X
:ONE EACH PART NUMBER   PHASE(S): PL LO X OO X DO X LS

REDUNDANCY SCREEN: A-FAIL B-FAIL C-PAS

PREPARED BY:		APPROVED BY:	APPROVED BY (NASA):
DES	W. HENRY	DES W.A. Henry 7/28/88	SSM [signature] 8/22
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ITEM:
SEALS, SIDE HATCH TUNNEL SEPARATION PLANE

FUNCTION:
THESE SEALS PREVENT LEAKAGE OF CREW MODULE ATMOSPHERE.

FAILURE MODE:
LEAKAGE

CAUSE(S):
CRACKS, LOW TEMPERATURE, MATERIAL DEGRADATION, ADVERSE TOLERANCES

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE

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

(B) FAILURE OF A SINGLE SEAL HAS NO EFFECT. LOSS OF REDUNDANT SEAL WOU 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 NO 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 A AN ADDITIONAL SEAL FAILURE WITHIN THE CREW MODULE COULD RESULT IN A LEA 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 & RATIONALE:
(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

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(A) DESIGN
SEALS ARE CONCENTRIC O-RING FACE SEALS INSTALLED IN JETTISONABLE COLLAR IN DOVETAIL GROOVES ADJACENT TO FRANGIBLE BOLTS, WITH METAL TO METAL CONTACT AT SEALED INTERFACE. SEAL MATERIAL IS SILICONE RUBBER.

(B) TEST
ACCEPTANCE TESTS: TUNNEL INTERFACE SEALS VERIFIED PER MLO206-0016 IN MANUFACTURING PROOF PRESSURE TEST TO 17.6 PSID IN TEST FIXTURE.
QUALIFICATION TESTS: QUALIFICATION TESTS WERE NOT PERFORMED, CERTIFICATION IS BASED ON ACCEPTANCE TESTS, SIMILARITY AND SEAL MATERIALS DATA.

OMRSD: CREW MODULE LEAK TEST TO 2 PSID WOULD NOT DETECT DUAL SEAL LEAKAGE.

(C) INSPECTION

RECEIVING INSPECTION
RECEIVING INSPECTORS CHECK FOR CORRECT IDENTITY AND FOR DAMAGE, VERIFY THAT SUPPLIER SUBMITTED REQUIRED REPORTS, AND VERIFY PARTS ARE PROPERLY PACKAGED TO PREVENT DAMAGE DURING STORAGE.

CONTAMINATION CONTROL
INSPECTORS VERIFY, BEFORE INSTALLATION, THAT THE SEAL AND THE SEALING SURFACE AND VITON SEAL ARE CLEAN PER MA0106-328.

ASSEMBLY/INSTALLATION
THE SEALS ARE INSTALLED PER MA0106-328. PRIOR TO INSTALLATION AN INSPECTION IS PERFORMED TO VERIFY THAT THE SEALING SURFACE IS NOT DAMAGED. INSPECTORS ALSO VERIFY SILICONE RUBBER SEAL SURFACE TO BE FREE OF DEFECTS, BLEMISHES, AND IRREGULARITIES PER DRAWING REQUIREMENTS, BEFORE INSTALLATION.

TESTING
THE ACCEPTANCE LEAK TEST WILL BE VERIFIED BY INSPECTORS.
HANDLING/PACKAGING
THE SUPPLIER PACKAGES DETAIL SEALS PER MK0116-001 REQUIREMENTS AND IDENTIFIES THEM BY PART NUMBER.

(D) FAILURE HISTORY
THIS IS A NEW DESIGN. THERE HAVE BEEN NO FAILURES OF SIMILAR INTERFACE.

(E) OPERATIONAL USE
IF LEAKAGE OCCURS, LOSS OF CREW MODULE CONSUMABLES CAN BE MONITORED AND ASSESSED FOR FEASIBILITY OF CONTINUING THE MISSION PER CABIN LEAK PROCEDURES AND FLIGHT RULES.