

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : CREW MODULE SEALS FMEA NO 01-4 -CS28 -1 REV:03/29/8

ASSEMBLY : SIDE HATCH TUNNEL	CRIT. FUNC: 1
P/N RI : V070-332559-001,-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 00 X DO X L

PREPARED BY:	REDUNDANCY SCREEN: A-FAIL B-FAIL C-PAS.	APPROVED BY (NASA):
DES W. HENRY	DES <u>W.A. Henry 7/25/88</u>	SSM <u>W. Smith 8/22</u>
REL D. MAYNE	REL <u>D.H. Mayne 8/22/88 PH/170</u>	REL <u>W. Smith 8/22/88</u>
QE W. SMITH	QE <u>W.S. Smith 7-25-88</u>	QE <u>W. Smith 3/16/88</u>

ITEM:
SEALS, TUNNEL/CREW MODULE STRUCTURAL INTERFACE

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

(A) DESIGN
SEALS ARE CONCENTRIC O-RING FACE SEALS INSTALLED IN DOVETAIL GROOVES IN THE CREW MODULE FLANGE ADJACENT TO STRUCTURAL ATTACH BOLTS, WITH METAL

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METAL CONTACT AT SEALED INTERFACE. SEAL MATERIAL IS SILICONE RUBBER.

(B) TEST

ACCEPTANCE TESTS: TUNNEL INTERFACE SEAL VERIFIED IN MANUFACTURING PROOF PRESSURE TESTS 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: CREW MODULE PRE-LIFTOFF LEAK TEST TO 2 PSID WOULD NOT DETECT DUA SEAL LEAKAGE.

(C) INSPECTION

RECEIVING INSPECTION

RECEIVING INSPECTOR CHECKS FOR CORRECT IDENTITY AND FOR DAMAGE, VERIFIE THAT SUPPLIER SUBMITTED REQUIRED REPORTS, AND VERIFIES PARTS ARE PROPER PACKAGED TO PREVENT DAMAGE DURING STORAGE.

CONTAMINATION CONTROL

INSPECTORS VERIFY CLEANLINESS REQUIREMENTS ARE MET.

ASSEMBLY/INSTALLATION

INSPECTORS VERIFY SILICONE RUBBER SEAL SURFACE TO BE FREE OF DEFECTS, BLEMISHES, AND IRREGULARITIES PER DRAWING REQUIREMENTS, BEFORE INSTALLATION.

TESTING

TUNNEL INTERFACE SEAL IS VERIFIED IN PROOF PRESSURE TEST TO 14.7 PSID A LEAK TEST TO 3.2 PSID.

HANDLING/PACKAGING

THE SUPPLIER PACKAGES DETAIL SEALS PER MK0116-001 REQUIREMENTS AND IDENTIFIES BY PART NUMBER.

(D) FAILURE HISTORY

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

(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.