SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :CREW MODULE SEALS FMEA NO 01-4-CS46-1 REV:03/29/88

ASSEMBLY :VENT SEVERANCE PANEL
P/N RI :
P/N VENDOR:M83248/1-368
QUANTITY :ONE

CRIT. FUNC: 1R
CRIT. HDW: 2

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X

PHASE(S): PL LO X OO X DO X LS

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

PREPARED BY:			APPROVED BY:	APPROVED BY (NASA):
DES	W.	HENRY	DES W.A. Henry 7/25/88	SSM Bill Smith 8/22
REL	D.	MAYNE	REL D.M. Mayne	REL R.E. ... 8/22/88
QE	W.	SMITH	QE ... 7-25-88	QE ... 5/10/93

ITEM:
SEAL, VENT SEVERANCE PANEL

FUNCTION:
THIS SEAL PREVENTS LEAKAGE OF CREW MODULE ATMOSPHERE INTO PAYLOAD BAY.

FAILURE MODE:
LEAKAGE

CAUSE(S):
CRACKS, LOW TEMPERATURE, MATERIAL DEGRADATION, CONTAMINATION

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

(A) FAILURE OF SINGLE SEAL WOULD RESULT IN THE LOSS OF CREW MODULE CONSUMABLES.

(B) FAILURE OF A SINGLE SEAL WOULD RESULT IN THE LOSS OF CREW MODULE CONSUMABLES.

(C) FAILURE OF A SINGLE 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 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
THIS SEAL IS STANDARD FLUOROCARBON ELASTOMER (VITON) O-RING FACE SEAL IN

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DOVETAIL GROOVE IN PANEL ADJACENT TO PANEL ATTACH BOLTS WITH METAL TO METAL CONTACT AT INTERFACE WHICH PREVENTS LEAKAGE OF CREW MODULE ATMOSPHERE BY SEALING STRUCTURAL INTERFACE BETWEEN VENT PANEL AND X576 BULKHEAD.

(B) TEST
ACCEPTANCE TESTS: TEST CONSISTS OF CREW MODULE LOW PRESSURE TEST TO 3.2 PSID.

QUALIFICATION TESTS: QUALIFICATION TESTS WERE NOT PERFORMED CERTIFICATIO 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 PANEL SEAL LEAKAGE.

(C) INSPECTION

RECEIVING INSPECTION
RECEIVING INSPECTORS INSPECT FOR DAMAGE AND WORKMANSHIP AND VERIFY SINGL PIECE MOLDED CONSTRUCTION. RECEIVING INSPECTORS CHECK IDENTIFICATION AND WALL CROSS-SECTIONAL DIAMETER ON A S-3 SAMPLING BASIS. IT IS ALSO VERIFIED THAT SUPPLIER SUBMITTED THE REQUIRED REPORTS.

CONTAMINATION CONTROL
RECEIVING INSPECTORS VISUALLY INSPECTS SEAL FOR CLEANLINESS. INSPECTORS ALSO VERIFY, BEFORE INSTALLATION, THAT THE SEAL AND SEALING SURFACE ARE CLEAN PER MA0106-328.

ASSEMBLY/INSTALLATION
THE SEALS ARE INSTALLED PER MA0106-328. INSPECTORS VERIFY THAT THE SEAL AND THE SEALING SURFACE ARE NOT DAMAGED BEFORE INSTALLATION.
TESTING
ACCEPTANCE TEST WILL BE VERIFIED BY INSPECTION.

HANDLING/PACKAGING
THE RECEIVING INSPECTORS VERIFY THAT THE SEAL IS INDIVIDUALLY PACKAGED WITH PART NUMBER, MANUFACTURER NAME, COMPOUND NUMBER AND CURE DATE. RECEIVING INSPECTORS ALSO VERIFY THAT THE SEAL IS PACKAGED IN A WAY THAT WILL PROTECT IT DURING STORAGE.

(D) FAILURE HISTORY
SIMILAR O-RINGS ARE EXTENSIVELY USED IN AEROSPACE APPLICATIONS WITH NO FAILURE HISTORY.

(E) OPERATIONAL USE
IF INTERFACE 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.