

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTUATION MECH-KU-BAND PYRO PMEA NO P2-4H-R104-1 REV:08/25/88

ASSEMBLY : KU-BAND ANTENNA JETTISON MECH				CRIT. FUNC:	1
P/N RI : SKD26100105-501				CRIT. HDW:	1
P/N VENDOR:		VEHICLE	102	103	104
QUANTITY : 1		EFFECTIVITY:	X	X	X
: ONE		PHASE(S) :	PL	LO	OO X DO LS

PREPARED BY:		REDUNDANCY SCREEN:	A-	B-	C-
DES R. H. YEE		APPROVED BY:			
REL M. B. MOSKOWITZ		DES <i>R.H. Yee for h.c. O'Connell</i>		APPROVED BY (NASA):	
QE E. M. GUTIERREZ		REL <i>M.B. Moskowitz</i>		SSM <i>Bill Thomas</i>	<i>Jan 9-12</i>
		QE <i>E.M. Gutierrez</i>		REL <i>Bill Thomas</i>	<i>7-7-88</i>
				QE <i>Bill Thomas</i>	<i>1-102 9-12-81</i>

ITEM:  
RELEASE NUT ASSEMBLY, KU-BAND ANTENNA JETTISON MECHANISM

FUNCTION:  
PYROTECHNICALLY ACTIVATED ASSEMBLY WILL RELEASE THE ANTENNA ASSEMBLY, IF THE ANTENNA CANNOT BE PROPERLY STOWED PRIOR TO DE-ORBIT/RE-ENTRY.

FAILURE MODE:  
FAILS TO FUNCTION UPON RECEIVING PRESSURE OUTPUT FROM EITHER OR BOTH REDUNDANT CARTRIDGES

MODE(S):  
BINDING OF PISTON, BLOWBY DUE TO DAMAGED PISTON SEAL, STRUCTURAL FAILURE, DUAL CARTRIDGE FAILURE

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

(A) LOSS OF FUNCTION.

(B) POSSIBLE INABILITY TO CLOSE PAYLOAD BAY DOORS IF ANTENNA CANNOT BE PROPERLY STOWED OR JETTISONED.

(C,D) POSSIBLE INABILITY TO DE-ORBIT SAFELY IF ANTENNA CANNOT BE JETTISONED; LOSS OF CREW/VEHICLE.

**SHUTTLE CRITICAL ITEMS LIST - ORBITER**

**SUBSYSTEM :ACTUATION MECH-KU-BAND PYRO FMEA NO P2-4H-R104-1 REV:08/25/88**

**DISPOSITION & RATIONALE:**

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

**(A) DESIGN**

DESIGN UTILIZES TWO (REDUNDANT) CARTRIDGES; A SINGLE 85% DOWN-LOADED CARTRIDGE IS SUFFICIENT TO RELEASE THE NUT. STRUCTURAL FACTOR OF SAFETY (GREATER THAN 1.4) IS HIGH ENOUGH TO ENSURE THAT THE ASSEMBLY WILL RESIST RUPTURE/BURSTING DUE TO SHRAPNEL OR HIGH GAS PRESSURE (WHEN FIRED WITH DUAL 120% CARTRIDGES).

**(B) TEST**

QUALIFICATION TESTS: SALT FOG, SHOCK, VIBRATION, THERMAL AND PRESSURE CYCLING, FIRINGS AT HIGH, AMBIENT AND LOW TEMPERATURE, AMBIENT FIRING WITH NO LOADS, FIRING AT -100 DEG F WITH LIMIT LOADS, ULTIMATE AND LIMIT LOADS ON NUT ASSEMBLY. MARGIN DEMONSTRATION FIRING WITH A SINGLE 85% DOWN-LOADED CARTRIDGE, STRUCTURAL MARGIN FIRING WITH TWO 120% UP-LOADED CARTRIDGES. (CR) 44-325-0025-0001, QTR OEA, INC. 2956-10/A.

ACCEPTANCE TESTS: INTERNAL PROOF PRESSURE TEST (1.2 X MAXIMUM OPERATING PRESSURE), LIMIT LOADS, WEIGHT VERIFICATION, LEAK TEST; ATP (OEA, INC.) #2956-7.

SYSTEM LEVEL TESTS: RANDOM VIBRATION, THERMAL CYCLING, AMBIENT FIRING (1) (CR) 44-544901-001.

OMRSD: NONE - HARDWARE INACCESSIBLE.

**(C) INSPECTION**

**RECEIVING INSPECTION**

RAW MATERIAL IS VERIFIED BY INSPECTION TO ASSURE SPECIFIED SHUTTLE REQUIREMENTS ARE SATISFIED.

**CONTAMINATION CONTROL**

CONTAMINATION CONTROL AND CORROSION PROTECTION PROCESSES AND STORAGE ENVIRONMENTS ARE MONITORED AND VERIFIED BY INSPECTION.

**ASSEMBLY/INSTALLATION**

PARTS ARE X-RAYED TO VERIFY CORRECT ASSEMBLY AND PRESENCE OF ALL DETAIL PARTS AND EXPLOSIVES. VISUAL INSPECTION, IDENTIFICATION PERFORMED, AND PARTS PROTECTION VERIFIED BY INSPECTION.

**NONDESTRUCTIVE EVALUATION**

X-RAYS ARE REVIEWED BY VENDOR, DCAS, NASA QUALITY, AND ENGINEERING.

**CRITICAL PROCESSES**

SELECTED MANUFACTURING/ASSEMBLY STEPS ARE IDENTIFIED BY NASA QUALITY ASSURANCE AND VERIFIED BY GOVERNMENT INSPECTION AS MANDATORY INSPECTION POINTS (MIPS). ALL MANUFACTURING PROCESSES, SUCH AS WELDING, PLATING, HEAT TREATING, PASSIVATION, AND ANODIZING ARE VERIFIED BY INSPECTION.

**HANDLING/PACKAGING**

HANDLING/PACKAGING REQUIREMENTS ARE VERIFIED BY INSPECTION.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ACTUATION MECH-KU-BAND PYRO FMEA NO P2-4H-R104-1 REV:08/25/88

(D) FAILURE HISTORY  
NONE.

(E) OPERATIONAL USE  
NONE.