SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :LANDING/DECELERATION-PYRO FMEA NO P2-1A -035-1 REV:12/02/87

ASSEMBLY :MAIN LANDING GEAR
P/N RI :SKD26100102-301
P/N VENDOR:
QUANTITY :2
:ONE PER LANDING GEAR

CRIT. FUNC: 1
CRIT. HDW: 1

VEHICLE EFFECTIVITY:	102	103	104
PHASE(S): PL	X	X	X
	LO	OO	DO X LS

REDUNDANCY SCREEN: A- B- C-

PREPARED BY:		APPROVED BY:		APPROVED BY (NASA):
DES	R. H. YEE	DES	12/4/87 R. H. yee for A. C. Ordway	SSM
REL	M. B. MOSKOWITZ	REL		REL
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ITEM:
PYRO-PRESSURE CARTRIDGE, UPLOCK RELEASE THRUSTER, MAIN LANDING GEAR

FUNCTION:
DUAL INITIATOR CARTRIDGE DELIVERS A PRESSURE OUTPUT TO ACTIVATE THE MAIN LANDING GEAR PYRO UPLOCK RELEASE THRUSTER AS AN EMERGENCY BACKUP TO PRIMARY HYDRAULIC SYSTEM. PYRO UPLOCK FUNCTIONS AUTOMATICALLY 1 SECOND AFTER GEAR DEPLOYMENT COMMAND IF PROXIMITY SWITCH DOES NOT SENSE MOVEMENT.

FAILURE MODE:
FAILS TO FUNCTION OR LOW PRESSURE OUTPUT

CAUSE(S):
DUAL INITIATOR FAILURE, LOSS OF DUAL ELECTRICAL SIGNAL TO NASA STANDARD INITIATORS (NSI'S) (REF. P2-6A-J05-1), CONTAMINATION OF PYRO MIX, HANDLING DAMAGE

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

(A) MAIN LANDING GEAR FAILS TO EXTEND. (LOSS OF HYDRAULIC SYSTEM #1 HAS TO OCCUR FIRST).

(B,C) NONE. EVENT OCCURS SECONDS BEFORE LANDING.

(D) POTENTIAL LOSS OF CREW/VEHICLE.

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

(A) DESIGN
DESIGN INCORPORATES DUAL INITIATORS. CARTRIDGE IS CAPABLE OF ACTIVATING UPLOCK RELEASE WITH 85% PROPELLANT LOAD.

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(B) TEST

QUALIFICATION TESTS: MARGINAL CARTRIDGE DEMONSTRATION WITH 85% LOAD, SHOCK, SALT FOG, RANDOM VIBRATION, THERMAL CYCLING BETWEEN -80 DEG F AND +350 DEG F, FIRINGS AT +350 DEG F, AMBIENT AND -80 DEG F, 8 FOOT DROP TEST. REF. CERTIFICATION REQUIREMENTS (CR) 26-325-0019-0001, SKD26100102; QTR SCOT INC. #1001-201.

ACCEPTANCE TESTS: 100% INTERNAL PROOF PRESSURE TEST, 100% LEAK TEST, TENSILE TEST (3 COUPONS FROM SAME HEAT TREAT LOT), WEIGHT VERIFICATION, LOT ACCEPTANCE FIRINGS OF RANDOM CARTRIDGES. REF. CR-26-325-0019-0001, ATP SCOT INC. #1001-301.

PYRO VERIFICATION TEST: SAMPLE LOT FIRING YEARLY AT KSC UNTIL AGE LIFE EXPIRES (V55AN0.050).

OMRSD: GROUND TURNAROUND INCLUDES PYRO INITIATOR CONTROLLER (PIC) RESISTANCE TEST (POST-HOOKUP) (V55AM0.110), PIC GO/NO-GO RESISTANCE TEST (PRE-HOOKUP) (V55AA0.020 AND V55AA0.030), POWER-OFF STRAY VOLTAGE CHECK (V55AM0.010), POWER-ON STRAY VOLTAGE CHECK (V55AA0.040), NSI ELECTRICAL VERIFICATION (V55AN0.010), AND PYRO FIRING TEST (LANDING GEAR) (V55AD0.000).

(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 AND N-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 AND N-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.

(D) FAILURE HISTORY
NONE

(E) OPERATIONAL USE
NONE.