SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :P/L RETEN & DEPLOY-MPM PYRO FMEA NO P2-5A-006-1 REV:08/12/88

ASSEMBLY :MPM SHOULDER AND PEDESTALS
P/N RI :SKD26100104-301
:MC325-0021-0002
QUANTITY :8

CRIT. FUNC: 1R
CRIT. HDW: 2

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL LO OO X DO LS

REDUNDANCY SCREEN: A-N/A B-N/A C-PASS

PREPARED BY:		APPROVED BY:	APPROVED BY (NASA): 9/12-8
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ITEM:
PRESSURE CARTRIDGE, RETRACTOR, MANIPULATOR POSITIONING MECHANISM (MPM) JETTISON

FUNCTION:
PROVIDES PYROTECHNIC PRESSURE OUTPUT FROM EITHER OR BOTH (REDUNDANT) PRESSURE CARTRIDGES TO OPERATE THE RETRACTOR IF MANIPULATOR ARM MUST BE JETTISONED.

FAILURE MODE:
FAILS TO FUNCTION OR LOW PRESSURE OUTPUT

CAUSE(S):
LOSS OF ELECTRICAL INPUT/NASA STANDARD INITIATOR (NSI), CONTAMINATION OR IMPROPER LOADING OF PYRO MIX, HANDLING DAMAGE

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

(A) LOSS OF REDUNDANCY.

(B) INABILITY TO CLOSE PAYLOAD BAY (PLB) DOORS IF BOTH CARTRIDGES FAIL. MPM PROTRUDES INTO PLB DOOR INNER MOLD LINE (IML).

(C,D) NO EFFECT FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE, IF BOTH CARTRIDGES FAIL, DUE TO INABILITY TO CLOSE PLB DOORS.

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

(A) DESIGN
DESIGN INCORPORATES DUAL (REDUNDANT) PRESSURE CARTRIDGES. A SINGLE 85% CARTRIDGE WILL OPERATE RETRACTOR.

(B) TEST

QUALIFICATION TESTS: SALT FOG, TEMPERATURE AND PRESSURE CYCLING, 8-FT DROP TEST, SHOCK, TRANSIENT AND RANDOM VIBRATION, HIGH/LOW/AMBIENT FIRIN WITH SINGLE AND DUAL CARTRIDGES, MARGIN DEMONSTRATION WITH SINGLE 85% CARTRIDGE, LOCKED SHUT. REF. CERTIFICATION REQUIREMENTS (CR) 44-325-0021-0001, QTR (SCOT, INC) 6004-201; SOS INC TR 6068; HSTC TR2-323.

ACCEPTANCE TESTS: TENSILE TESTS AND PROOF PRESSURE HOUSINGS, EXPLOSIVE WEIGHT VERIFICATION, HELIUM LEAK TEST, N-RAY AND X-RAY TEST, BRIDGEWIRE RESISTANCE TEST. CR-44-325-0021-0001; ATP (SCOT, INC) 6004-301.

SYSTEM LEVEL TESTS: AMBIENT SIMULATED ZERO-G FIRINGS FOR SHOULDER AND FORWARD PEDESTAL RETENTION FITTING - DUAL CARTRIDGE FIRING.

PRE-FLIGHT VERIFICATION TESTS: SAMPLE LOT FIRING YEARLY AT KSC UNTIL AG LIFE EXPIRES.

OMRSD: GROUND TURNAROUND INCLUDES PYRO INITIATOR CONTROLLER (PIC) RESISTANCE TEST (POST-HOOKUP), PIC GO/NO-GO RESISTANCE TEST (PRE-HOOKUP) POWER-OFF STRAY VOLTAGE CHECK, POWER-ON STRAY VOLTAGE CHECK, NSI ELECTRICAL VERIFICATION, RMS JETTISON VERIFICATION, AND RMS JETTISON RESET/DEADFACE VERIFICATION.

(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 ARE VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION
VISUAL INSPECTION, IDENTIFICATION PERFORMED, AND PARTS PROTECTION VERIFIED BY INSPECTION. SELECTED MANUFACTURING/ASSEMBLY STEPS ARE IDENTIFIED BY NASA QUALITY ASSURANCE AND VERIFIED BY GOVERNMENT INSPECTION AS MANDATORY INSPECTION POINTS (MIPS).

NONDESTRUCTIVE EVALUATION
PARTS ARE X-RAYED AND N-RAYED TO VERIFY CORRECT ASSEMBLY AND PRESENCE OF ALL DETAIL PARTS AND EXPLOSIVES. X-RAYS AND N-RAYS ARE REVIEWED BY VENDOR, DCAS, NASA QUALITY, AND ENGINEERING.

CRITICAL PROCESSES
ALL MANUFACTURING PROCESSES, SUCH AS WELDING, HEAT TREATING, PASSIVATION AND ANODIZING ARE VERIFIED BY INSPECTION.

TESTING
ATP IS VERIFIED PER PROCEDURE.

HANDLING/PACKAGING
HANDLING, PACKAGING AND STORAGE ENVIRONMENTS ARE VERIFIED BY INSPECTION.

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

(E) OPERATIONAL USE
NONE.