

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : LANDING/DECELERATION-PYRO FMEA NO P2-LA -107 -1 REV:12/02/87

ASSEMBLY : NOSE LANDING GEAR	CRIT. FUNC:	1R
P/N RI : SKD26100100-301	CRIT. HDW:	2
P/N VENDOR:	VEHICLE	102 103 104
QUANTITY : 2	EFFECTIVITY:	X X X
: TWO PRESSURE CARTRIDGES	PHASE(S):	PL LO OO DO X LS

PREPARED BY:	REDUNDANCY SCREEN:	A-N/A	B-N/A	C-PASS
DES R. H. YEE	APPROVED BY:	12/14/87	APPROVED BY (NASA):	1-7-87
REL M. B. MOSKOWITZ	DESCR <i>Use for A.C. O rdnry</i>	SSM <i>Rick Thomas</i>	REL <i>See serial 12-16-87</i>	
QE E. M. GUTIERREZ	QE <i>[Signature]</i>	QE <i>[Signature]</i>	1-7-87	

ITEM:

PYRO-PRESSURE CARTRIDGE, EXTENSION THRUSTER, NOSE LANDING GEAR

FUNCTION:

DUAL CARTRIDGES ACTIVATE PYRO THRUSTER TO PROVIDE ASSIST IN INITIAL PHASE OF NOSE GEAR EXTENSION IN WHICH THE GEAR DOORS ARE OPENED (FIRES EVERY FLIGHT).

FAILURE MODE:

FAILS TO FUNCTION OR LOW PRESSURE OUTPUT

CAUSE(S):

INITIATOR FAILURE, LOSS OF DUAL ELECTRICAL SIGNALS TO NASA STANDARD INITIATOR (NSI'S) (REF. P2-5A-J05-1), CONTAMINATION OF PYRO MIX

EFFECT(S) ON:

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

(A) LOSS OF REDUNDANCY.

(B,C,D) NONE. REDUNDANT CARTRIDGE AVAILABLE TO ACCOMPLISH FUNCTION. POTENTIAL CREW/VEHICLE LOSS IF BOTH CARTRIDGES FAIL (NOSE GEAR FAILS TO DEPLOY).

DISPOSITION & RATIONALE:

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

(A) DESIGN

ONE OF THE TWO REDUNDANT PRESSURE CARTRIDGES, AT 85% OF NOMINAL OUTPUT, IS SUFFICIENT TO OPERATE THRUSTER.

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(B) TEST

QUALIFICATION TESTS: QUALIFIED AS PART OF SKD26100100-205 EXTENSION THRUSTER. VIBRATION, MARGINAL CARTRIDGE ACTUATION (85%), -65 DEG F/ AMBIENT/+200 DEG F FIRINGS, MASS OFF-SET FIRING (SINGLE AND DUAL CTG), LOCKED SHUT FIRING. CERTIFICATION REQUIREMENTS (CR) 26-325-0006-0002, QTR OEA INC. #2737-8; SKD26100100.

ACCEPTANCE TESTS: HELIUM LEAK TEST, EXPLOSIVE WEIGHT, HOUSING PROOF PRESSURE (1.2 X MAXIMUM OPERATING PRESSURE), TENSILE TEST COUPONS FROM HEAT LOT, LOT ACCEPTANCE FIRINGS ON RANDOM SAMPLES. ATP OEA INC. #2737-7; SKD26100100.

SYSTEM TESTS (AT DOWNEY): DUAL 100% CTG THRUSTER ACTUATION AT AMBIENT O. LANDING GEAR TEST ASSEMBLY.

PRE-FLIGHT VERIFICATION TESTS (PVT): SAMPLE LOT FIRING YEARLY AT KSC UNTIL AGE LIFE EXPIRES.

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 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.

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SUBSYSTEM : LANDING/DECELERATION-PYRO FMEA NO P2-1A -107 -1 REV:12/02/87

HANDLING/PACKAGING

STORAGE ENVIRONMENTS ARE MONITORED AND VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

NONE.

(E) OPERATIONAL USE

NONE.