

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : LANDING/DECELERATION-LGC FMEA NO 02-1A -102 -2 REV:09/06/88

ASSEMBLY : NOSE LANDING GEAR (NLG)

P/N RI : V07Q-510751

P/N VENDOR:

QUANTITY : 1  
: ONE ASSY

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

CRIT. FUNC: :  
CRIT. HDW: :

PREPARED BY:	REDUNDANCY SCREEN:	A-	B-	C-
DES R. A. GORDON	APPROVED BY:	APPROVED BY (NASA)		
REL J. S. MULLEN	DES <i>R. Gordon 9/24/88</i>	SSM <i>Charles...</i>		
QE W. J. SMITH	REL <i>W. J. Smith</i>	REL <i>W. J. Smith 9/24/88</i>		
	QE <i>W. J. Smith</i>	QE <i>W. J. Smith</i>		

ITEM:

NOSE LANDING GEAR BOOSTER BUNGEE - DOOR EXTENSION ASSIST

FUNCTION:

SPRING BUNGEE SYSTEM WHICH CONSISTS OF A COMPRESSION SPRING UNIT MOUNTED SO THAT THE ACTION WOULD BE RELEASED BY DOOR LATCH OPENING, EXERTING FORCE INTO ROLLERS WHICH CONTACT A STRIKER PLATE AND ADJUSTS GEAR DOOR OPENING OPERATION.

FAILURE MODE:

PREMATURE RELEASE

CAUSE(S):

STRUCTURAL FAILURE OF A PIECE PART WITHIN THE SPRING BUNGEE RELEASE LINKAGE.

EFFECT(S) ON:

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

(A, B) LEAKAGE THRU DOOR SEAL EXPOSING COMPARTMENT TO HIGH THERMAL FLOWS POSSIBLE STRUCTURAL INTERNAL DAMAGE TO COMPARTMENT.

(C, D) POSSIBLE LOSS OF MISSION/CREW/VEHICLE DUE TO RE-ENTRY OVERHEATING

DISPOSITION & RATIONALE:

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

(A) DESIGN

ALL PARTS WITHIN THE SPRING BUNGEE RELEASE LINKAGE ARE DESIGNED TO OPERATE FOR 400 CYCLES WITHOUT STRUCTURAL DEGRADATION. DESIGNED TO A SAFETY FACTOR OF 1.4.

(B) TEST

THE BOOSTER BUNGEE WAS CERTIFIED AS AN INTEGRAL PART OF THE NLG MECHANICAL INSTALLATION (LANDING GEAR OPERATION) - 32 CYCLES OF THE LANDING GEAR DURING ALT, 15 DEVELOPMENT CYCLES AND 353 QUALIFICATION LIFE CYCLES FOR TOTAL OF 400 CYCLES. (THE LANDING GEAR WAS CYCLED FROM UP AND LOCKED T DOWN AND LOCKED EACH TIME).

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**ENVIRONMENTS:**

HIGH TEMP TESTS; 3 CYCLES AT 140 DEG F

COLD TEMP TESTS; 3 CYCLES AT -35 DEG F TO -40 DEG F

ALL OTHER ENVIRONMENTAL TESTS WERE DONE BY SIMILARITY TO EXISTING HARDWARE.

OMRSD: NLG/MLG DOOR BOOSTER BUNGEE INSPECTION, NLG WHEELWELL ZONAL INTERNAL DETAIL INSPECTION; THESE INSPECTIONS VERIFY THE CONDITION AND SECURITY OF THE BUNGEE AND IT'S ATTACHMENTS, VISUALLY INSPECTS THE ATTENUATION CORE OF THE BOOSTER BUNGEE AFTER COCKING, CHECKS THAT BUN SPRING ENGAGE ARM IS ALIGNED FOR PROPER OPERATION OF IT'S SWITCH INDICATOR AND VERIFIES FUNCTION USING GSE TOOL.

NLG/MLG RETRACT FOR FLIGHT: VERIFIES THAT THE BOOSTER BUNGEE IS COCK AND GROUND LOCK PINS AND BUNGEE TRIGGER PINS ARE REMOVED. FUNCTION IS VERIFIED BY USING GSE TOOL.

FREQUENCY - ALL VEHICLES AT GROUND TURNAROUND.

**(C) INSPECTION**

**RECEIVING INSPECTION**

RECEIVING INSPECTION VERIFIES MATERIALS AND PROCESSES CERTIFICATIONS.

**CONTAMINATION CONTROL**

INSPECTION VERIFIES CORROSION PROTECTION REQUIREMENTS. INSPECTION VERIFIES CLEANLINESS REQUIREMENTS.

**ASSEMBLY/INSTALLATION**

FABRICATION OF DETAIL COMPONENTS PER DRAWING AND APPLICABLE SPECIFICATIONS VERIFIED BY INSPECTION ON MANUFACTURING ORDERS. INSTALLATION OF BUNGEE ASSEMBLED COMPONENTS SEQUENTIALLY PLANNED IN ORDER TO MAINTAIN DRAWING CONFIGURATION WHILE ASSEMBLING PARTS PER DRAWING, PAYING CLOSE ATTENTION TO SPECIAL ADJUSTMENTS COVERED PER DRAWING GENERAL NOTES TO OBTAIN DESIRED LOAD ON SPRING MECHANISM. DIMENSIONS AND SURFACE ROUGHNESS VERIFIED BY INSPECTION. INSPECTION VERIFIES ALL THREADED FASTENERS INSTALLATION TO CORRECT TORQUE VALUES SPECIFIC ON DRAWING.

**CRITICAL PROCESSES**

HEAT TREATING IS VERIFIED BY INSPECTION.

**NONDESTRUCTIVE EVALUATION**

PENETRANT INSPECTION OF DETAIL PARTS VERIFIED BY INSPECTION.

**TESTING**

ATP IS VERIFIED BY INSPECTION.

**PACKAGING/HANDLING**

HANDLING AND PACKAGING REQUIREMENTS ARE VERIFIED BY INSPECTION.

**(D) FAILURE HISTORY**

NONE.

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(E) OPERATIONAL USE  
NONE.

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