

PAGE: 1

PRINT DATE: 06/08/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: MO-AA4-105-X

S050250L
ATTACHMENT -
Page 105 of 152

SUBSYSTEM NAME: STABILIZED PAYLOAD DEPLOYMENT SYSTEM
REVISION : 2 06/08/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ SRU :	SPRING, SUPPORT ARM ASSEMBLY	V790-544077

PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

■ QUANTITY OF LIKE ITEMS: 4
TWO PER PEDESTAL

■ FUNCTION:
THE 20 SPRINGS OF THE SUPPORT ARM ASSEMBLY RAISE THE PEDESTAL
APPROXIMATELY TWO INCHES AFTER THE ADJACENT PRLAS'S AND KEEL LATCHES ARE
RELEASED.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: NO-AA4-105-01

REVISION# 2 06/08/90
SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM

ITEM NAME: SPRING, SUPPORT ARM ASSEMBLY

CRITICALITY OF THIS
FAILURE MODE: 2R3

■ FAILURE MODE:
FAILS TO EXTEND

MISSION PHASE:
00 ON-ORBIT

■ VEHICLE/PAYLOAD/KIT EFFECTIVITY:	102	COLUMBIA
	: 103	DISCOVERY
	: 104	ATLANTIS
	: 105	ENDEAVOUR

■ CAUSE:
STRUCTURAL FAILURE

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

■ REDUNDANCY SCREEN	A) PASS
■	B) FAIL
■	C) PASS

PASS/FAIL RATIONALE:

- A)
PRELAUNCH INSPECTION
- B)
FAILURE OF A SINGLE SPRING WOULD NOT CAUSE A CHANGE IN PEDESTAL HEIGHT OR SIGN: A CHANGE OF CONDITION.
- C)
PHYSICAL SEPARATION OF COMPONENTS.

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
FIRST FAILURE - NO EFFECT; PEDESTAL WILL MOVE TO REQUIRED HEIGHT. LOSS OF ALL REDUNDANCY RESULTS IN INABILITY TO TRANSLATE THE REQUIRED TWO INCHES IN THE Z DIRECTION.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AA4-105-01

- (B) INTERFACING SUBSYSTEM(S):
LOSS OF ALL REDUNDANCY RESULTS IN INABILITY TO PROVIDE ADEQUATE CLEARANCE WITH THE KEEL LATCH.
- (C) MISSION:
LOSS OF ALL REDUNDANCY PRIOR TO DEPLOYMENT RESULTS IN MISSION ABORT.
- (D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT ON CREW/VEHICLE.
- (E) FUNCTIONAL CRITICALITY EFFECTS:
LOSS OF FUNCTION WILL RESULT IN INABILITY TO RELEASE/DEPLOY PAYLOAD.

- DISPOSITION RATIONALE -

- (A) DESIGN:
THE SPRINGS ARE MADE OF HIGH STRENGTH CORROSION RESISTANT MATERIAL FOR SPACE ENVIRONMENT USE. THE DESIGN SHOWS POSITIVE STRUCTURAL MARGIN BY ANALYSIS AND MEETS 1.4 MINIMUM FACTOR OF SAFETY.
- (B) TEST:
QUALIFICATION TESTS PER DTP4779-801 WERE SUCCESSFULLY COMPLETED JANUARY 5, 1990 AND WILL BE DOCUMENTED IN TEST REPORT STS9000115.

OMRSD: GROUND TURNAROUND
FREQUENCY OF CHECKOUT IS MISSION DEPENDENT. ZO EXTEND
INDICATION/VERIFICATION
- (C) INSPECTION:
ALL DIMENSIONAL CHARACTERISTICS ARE VERIFIED BY INSPECTION. PROCESSES ARE VERIFIED BY INSPECTION EITHER AT ROCKWELL OR AT SUPPLIER FACILITIES.
- (D) FAILURE HISTORY:
NONE.
- (E) OPERATIONAL USE:
NONE.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AA4-105-01

- APPROVALS -

RELIABILITY ENGINEERING: W. R. MARLOWE
DESIGN ENGINEERING : G. CAMPBELL
QUALITY ENGINEERING : M. F. MERGEN
NASA RELIABILITY :
NASA SUBSYSTEM MANAGER :
NASA QUALITY ASSURANCE :

W. P. Roegner 6-15-90
d.t. [unclear] 6-15-90
Colin Balline for 6/14/90
[unclear] 9/7/90
[unclear] 9/25/90
[unclear] 9/25/90

G.E