

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE  
NUMBER: MO-AA3-305-X

SUBSYSTEM NAME: STABILIZED PAYLOAD DEPLOYMENT SYSTEM  
REVISION : 2 09/05/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ SRU :	GEAR BOX - YO DRIVE	V790-544130

PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

■ QUANTITY OF LIKE ITEMS: 2  
ONE PER PEDESTAL ASSEMBLY

■ FUNCTION:

A GEAR BOX, WHICH IS A PART OF EACH OF THE PEDESTALS, CONVERTS THE TORQUE SUPPLIED BY THE YO ACTUATOR INTO INBOARD AND OUTBOARD PEDESTAL MOTION AND TO LOAD THE BUNGEE. BOTH PEDESTALS MUST MOVE OUTBOARD TO ACCOMPLISH KEEL LATCH RELEASE CLEARANCE. THE LIMIT SWITCH ACTUATING CAM IS A PART OF THE GEAR BOX ASSEMBLY AND CAUSES ITS SWITCHES TO FUNCTION WHEN LOADS AND POSITIONS ARE CORRECT.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE  
NUMBER: MO-AA3-305-01

SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM REVISION# 2 09/05/90

ITEM NAME: GEAR BOX - YO DRIVE CRITICALITY OF THIS FAILURE MODE: 2/2

■ FAILURE MODE:  
PHYSICAL BINDING/JAMMING, FAILS FREE

MISSION PHASE:  
00 ON-ORBIT

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

■ CAUSE:  
CONTAMINATION

■ CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

■ REDUNDANCY SCREEN A) N/A  
 ■ B) N/A  
 ■ C) N/A

PASS/FAIL RATIONALE:

■ A)

■ B)

■ C)

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:  
FIRST FAILURE LOSS OF REDUNDANCY. SECOND FAILURE YO POSITIONING IS LOST.

■ (B) INTERFACING SUBSYSTEM(S):  
POSSIBLE CONTACT WITH RADIATOR DURING LANDING IF FAILURE OCCURS AFTER P/L DEPLOYMENT.

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**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE  
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- (C) MISSION:  
LOSS OF MISSION IF FAILURE OCCURS DURING DEPLOYMENT.
- (D) CREW, VEHICLE, AND ELEMENT(S):  
FAILURE RESULTS IN POSSIBLE DAMAGE TO RADIATOR AND LOSS OF FREON LOOP DURING LANDING.
- (E) FUNCTIONAL CRITICALITY EFFECTS:  
LOSS OF FUNCTION COULD RESULT IN MISSION ABORT.

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 - DISPOSITION RATIONALE -  
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- (A) DESIGN:  
THE GEAR BOX ASSEMBLY IS 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 ON JANUARY 5, 1990 AND WILL BE DOCUMENTED IN TEST REPORT STS9000115.  
  
OMRSD: GROUND TURNAROUND  
FREQUENCY OF CHECKOUT IS MISSION DEPENDENT. S0790A.060-A, -B, -C.  
ALTERNATE PANEL VERIFICATION S079A.070-A, -B, -C.
- (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

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- APPROVALS -

RELIABILITY ENGINEERING:	W. R. MARLOWE	<i>WRM</i>	:	<i>M.P. R...</i>	<i>9/7/90</i>
DESIGN ENGINEERING	: G. CAMPBELL	<i>GC</i>	:	<i>G. Campbell</i>	<i>9/7/90</i>
QUALITY ENGINEERING	: M. F. MERGEN	<i>CFR</i>	:	<i>M.F. Mergen</i>	<i>9/12/90</i>
NASA RELIABILITY	:	<i>G-E</i>	:		
NASA SUBSYSTEM MANAGER	:		:		
NASA QUALITY ASSURANCE	:		:		

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