

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: MO-AA3-505-X

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

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ SRU :	DRIVE SHAFT ASSEMBLY	V082-544922

PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

■ QUANTITY OF LIKE ITEMS: 1
ONE PER END ITEM

■ FUNCTION:

THE DRIVE SHAFT ASSEMBLY TRANSMITS TORQUE DEVELOPED BY THE Y₀ ACTUATOR TO THE CHAIN ASSEMBLY AND SUBSEQUENTLY TO THE GEAR BOX ON BOTH THE PRIMARY AND SECONDARY PEDESTALS. FOURTEEN MAJOR DRIVE SHAFT SEGMENTS MAKE UP THIS ASSEMBLY USING THE FOLLOWING PART NUMBERS: V082-544914, V082-544915, V082-544922, V082-544923, V082-544900, V790-544183, AND V790-544230. BY LOCATION, A FAILURE COULD OCCUR BETWEEN THE ACTUATOR AND THE PRIMARY PEDESTAL, OR BETWEEN THE PRIMARY AND SECONDARY PEDESTALS. BY OPERATION, A FAILURE COULD OCCUR AT ANY POINT IN THE OUTBOARD, INBOARD, OR (RE)BERTH CYCLES.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AA3-505-01

SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM

REVISION# 2 09/05/90

ITEM NAME: DRIVE SHAFT ASSEMBLY

CRITICALITY OF THIS
FAILURE MODE:2/2

- FAILURE MODE:
FAILS FREE OR PHYSICAL BINDING/JAMMING

MISSION PHASE:
00 ON-ORBIT

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

- CAUSE:
ADVERSE TOLERANCES, WEAR, CORROSION, FATIGUE, EXCESSIVE LOAD

- CRITICALITY I/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:
THE FAILURE OCCURS FORWARD OF PRIMARY PEDESTAL, YO MONITORING IS LOST.
IF FAILURE OCCURS BETWEEN PRIMARY AND SECONDARY PEDESTAL THEN ONLY
PRIMARY PEDESTAL MOVES.

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- (B) INTERFACING SUBSYSTEM(S):
POSSIBLE CONTACT WITH RADIATOR DURING LANDING IF FAILURE OCCURS AT FULL DEPLOYMENT.
- (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

- DISPOSITION RATIONALE -

- (A) DESIGN:
THE SHAFT 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 S'S9000115.

OMRSD: GROUND TURNAROUND
FREQUENCY OF CHECKOUT IS MISSION DEPENDENT. YO OUTBOARD-TO-INBOARD VERIFICATION S0790A.060-A, -B, -C.
- (C) INSPECTION:
ALL DIMENSIONAL CHARACTERISTICS ARE VERIFIED BY INSPECTION. PROCESSES ARE VERIFIED BY INSPECTION EITHER AT ROCKWELL OR AT SUPPLIER FACILITIES. THE CLEANLINESS AND MATERIAL CERTIFICATION ARE VERIFIED BY INSPECTION.
- (D) FAILURE HISTORY:
NONE
- (E) OPERATIONAL USE:
NONE

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- APPROVALS -

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

9/12/90