

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: MO-AA3-105-X

SUBSYSTEM NAME: STABILIZED PAYLOAD DEPLOYMENT SYSTEM

REVISION : 2 06/06/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ SRU :	CHAIN ASSEMBLY	V790-544160

PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

■ QUANTITY OF LIKE ITEMS: 2
ONE PER PEDESTAL ASSEMBLY

■ FUNCTION:

CHAIN ASSEMBLY - SPDS

THE CHAIN ASSEMBLY SERVES AS AN INTERFACE BETWEEN THE DRIVE SHAFT ASSEMBLY AND THE PEDESTAL GEAR BOX. THIS UNIT TRANSFERS THE TORQUE DEVELOPED BY THE YO ACTUATOR AND TRANSMITTED BY THE DRIVE SHAFT ASSEMBLY TO THE GEAR BOX

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ATTACHMENT -
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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AA3-105-01

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

ITEM NAME: CHAIN 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:
CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION, TEMPERATURE,
LOSS OF LUBRICANT - LUBE NOT REQUIRED FOR PROPER OPERATION (ONLY
IMPROVES EFFICIENCY)

■ CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

PASS/FAIL RATIONALE:

■ A)
GROUND INSTALLATION AND CHECKOUT

■ B)

■ C)

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
IF ONE CHAIN FAILS FREE, ONLY THE OTHER PEDESTAL MOVES, IF ONE CHAIN
JAMS, YO POSITIONING IS LOST. STARBOARD LATCH WOULD STILL BE LATCHED
SO P/L COULD BE RETURNED.

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

 - DISPOSITION RATIONALE -

- **(A) DESIGN:**
THE CHAIN 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 JANUARY 5, 1990 AND WILL BE DOCUMENTED IN TEST REPORT STS9000115.

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:**
NO HISTORY
- **(E) OPERATIONAL USE:**
NONE

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- APPROVALS -

RELIABILITY ENGINEERING:	W. R. MARLOWE	<i>W.R.M.</i>	<i>6-15-90</i>
DESIGN ENGINEERING	: G. CAMPBELL	<i>G.C.</i>	<i>6/15/90</i>
QUALITY ENGINEERING	: M. F. MERGEN	<i>M.F.M.</i>	<i>6/14/90</i>
NASA RELIABILITY	:	<i>G.E.</i>	<i>9/17/90</i>
NASA SUBSYSTEM MANAGER	:		<i>9/25/90</i>
NASA QUALITY ASSURANCE	:		<i>9/19/90</i>