

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER: 02-2A-011114 -X**

**SUBSYSTEM NAME: FLIGHT CONTROL MECH - RUDDER SPEED BRAKE & BF
REVISION: 0 02/02/88**

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
ASSY	: RUDDER/SPEEDBRAKE (R/SB)	MC621-0053-0068
	SUN	5004918B
SRU	: POSITION TRANSDUCER	

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
POSITION TRANSDUCER

REFERENCE DESIGNATORS:

QUANTITY OF LIKE ITEMS: 2
ONE ASSEMBLY PER RUDDER & SPEEDBRAKE

FUNCTION:
ONE ASSEMBLY OF FOUR TRANSDUCERS TRANSMIT ELECTRICAL SIGNALS TO AVIONICS RELATIVE TO RUDDER OR SPEEDBRAKE SUMMER REVOLUTIONS PROPORTIONAL TO SURFACE POSITION.

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: 02-2A-011114- 02

REVISION#: 1 08/07/98

SUBSYSTEM NAME: FLIGHT CONTROL MECH - RUDDER SPEED BRAKE & BF

LRU:

CRITICALITY OF THIS

ITEM NAME: POSITION TRANSDUCER

FAILURE MODE: 1/1

FAILURE MODE:

LOSS OF MECHANICAL INPUT/ELECTRICAL OUTPUT, ALL FOUR RUDDER OR SPEEDBRAKE TRANSDUCERS.

MISSION PHASE: DO DE-ORBIT

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

CAUSE:

TRANSDUCER DRIVE TRAIN FAILURE

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:

LOSS OF RUDDER OR SPEEDBRAKE SURFACE POSITION FEEDBACK, RESULTING IN LOSS OF RUDDER OR SPEEDBRAKE FUNCTIONS.

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(B) INTERFACING SUBSYSTEM(S):
NONE.

(C) MISSION:
LOSS OF MISSION, CREW/VEHICLE.

(D) CREW, VEHICLE, AND ELEMENT(S):
SAME AS (C)

-DISPOSITION RATIONALE-

(A) DESIGN:
BRUSHLESS-QUADRUPLE RVDT WITH NO ELECTRICAL CONNECTIONS TO ROTOR. THERE ARE FOUR ISOLATED STATOR WINDINGS. SPLINES HEAT TREATED PER CP09-9310 CHDF01. TRANSDUCER DRIVE TRAIN IS OVERSIZED FOR IMPOSED LOAD

(B) TEST:
QUALIFICATION TESTS: LIFE CYCLE TEST, VIBRATION TEST AT POWER DRIVE UNIT (PDU) ASSEMBLY (20 TO 2,000 HZ RANDOM), AND THERMAL TEST(-40 DEG F +275 DEG F).

ACCEPTANCE TESTS: INCLUDES INPUT POWER CHARACTERISTICS, OUTPUT PHASING, OUTPUT SIGNAL CHARACTERISTICS, SCALING, ACCURACY, TRACKING, NULL VOLTAGE, AND PHASE SHIFT

GROUND TURNAROUND TEST
ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:
RECEIVING INSPECTION
COMPONENT MATERIAL AND HEAT TREAT CERTIFICATIONS ARE REQUIRED. SPECIAL MATERIAL REQUIREMENTS ARE IDENTIFIED IN CERTIFICATIONS.

ASSEMBLY/INSTALLATION
POSITION TRANSDUCER ASSEMBLY INSTALLATION/TORQUES ARE VERIFIED BY INSPECTION

CRITICAL PROCESSES

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HEAT TREATING IS VERIFIED BY INSPECTION

TESTING
ATP IS VERIFIED BY INSPECTION. PERFORMANCE LEVELS DURING POSITION
TRANSDUCER ATP AND DURING PDU ATP VERIFIED BY INSPECTION

(D) FAILURE HISTORY:
CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND
OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE
FOUND IN THE PRACA DATA BASE.

(E) OPERATIONAL USE:
NONE.

- APPROVALS -

EDITORIALLY APPROVED : BNA : J. Komura 8-18-98
TECHNICAL APPROVAL : VIA APPROVAL FORM : 95-CIL-009_02-2A