1) CIL ITEM : J802-01
2) FMEA CODE : J802
3) COMPONENT : FLIGHT ACCELEROMETER
4) PART NUMBER : RES7010
5) SYSTEM/SUBSYSTEM : SENSORS/JXKN (FASCOS REDLINE ACTIVE)
6) FAILURE MODE : OPEN OR SHORT CIRCUIT

7) PREPARED : SSME RELIABILITY
8) APPROVED :
9) DATE : 04-19-96
10) REVISION/CHANGE : -001/0
11) EFFECTIVITY : -02
12) HAZARD REFERENCE : SEE LISTINGS BELOW
13) CCBD # : me3-01-328

TIVE)

PHASE	FAILURE DESCRIPTION/EFFECT	CRITICALITY
SM 4-2	FAILURE OF TWO ACCELEROMETER SIGNALS OUTSIDE OF QUALIFICATION LIMITS CAUSES CHANNEL DISQUALIFICATIONS RESULTING IN A LOSS OF REDLINE PROTECTION. LOSS OF VEHICLE DUE TO TURBOPUMP FAILURE MAY RESULT IF EXCESSIVE VIBRATION OCCURS AND IS NOT DETECTED. REDUNDANCY SCREENS: FASCOS SYSTEM - TURBOPUMP SYSTEM: UNLIKE REDUNDANCY ---------- A: PASS. REDUNDANT HARDWARE ITEMS ARE CAPABLE OF CHECKOUT DURING NORMAL GROUND TURNAROUND. B: PASS. LOSS OF A REDUNDANT HARDWARE ITEM IS DETECTABLE DURING FLIGHT. C: PASS. LOSS OF REDUNDANT HARDWARE ITEMS COULD NOT RESULT FROM A SINGLE CREDIBLE EVENT.	IR HAZARD REF: ME-C1S,M, ME-D1S,M
SM 4-3	FAILURE OF ONE QUALIFIED ACCELEROMETER SIGNAL WITHIN REDLINE LIMITS RESULTS IN LOSS OF REDLINE PROTECTION. LOSS OF VEHICLE DUE TO TURBOPUMP FAILURE MAY RESULT IF EXCESSIVE VIBRATION OCCURS AND IS NOT DETECTED. REDUNDANCY SCREENS: FASCOS SYSTEM - TURBOPUMP SYSTEM: UNLIKE REDUNDANCY ---------- A: PASS. REDUNDANT HARDWARE ITEMS ARE CAPABLE OF CHECKOUT DURING NORMAL GROUND TURNAROUND. B: FAIL. LOSS OF A REDUNDANT HARDWARE ITEM IS NOT DETECTABLE DURING FLIGHT. C: PASS. LOSS OF REDUNDANT HARDWARE ITEMS COULD NOT RESULT FROM A SINGLE CREDIBLE EVENT.	IR HAZARD REF: ME-C1S,M, ME-D1S,M
SM 4-4	FAILURE OF TWO REMAINING OR ALL QUALIFIED ACCELEROMETER SIGNALS OUTSIDE OF REDLINE MONITOR LIMITS CAUSES ERRONEOUS ENGINE SHUTDOWN. MISSION ABORT. REDUNDANCY SCREENS: FASCOS SYSTEM: LIKE REDUNDANCY ---------- A: PASS. REDUNDANT HARDWARE ITEMS ARE CAPABLE OF CHECKOUT DURING NORMAL GROUND TURNAROUND. B: FAIL. LOSS OF A REDUNDANT HARDWARE ITEM IS NOT DETECTABLE DURING FLIGHT. C: PASS. LOSS OF REDUNDANT HARDWARE ITEMS COULD NOT RESULT FROM A SINGLE CREDIBLE EVENT.	IR HAZARD REF: ME-C1S,M, ME-D1S,M

CIL ITEM: J802-01	DESIGN	DOCUMENT REF.
	ALL CAUSES: ELECTRICAL TERMINATION OR WIRE FAILURE. ELECTRICAL TERMINATION OR WIRE INSULATION ABRADES AND SHORTS TO ACCELEROMETER CASE. THE ELECTRICAL WIRES FROM THE SENSING ELEMENT TO THE COAXIAL CONNECTOR ARE ROUTED UP THE INTERNAL CASE WALL. POTTING IS APPLIED AT BOTH CONNECTION ENDS AND FREQUENT PERIODIC POINTS ALONG THE CASE WALL PATH. UNPOTTED AREAS EXIST SO THE WIRE CAN REACT TO CHANGING THERMAL CONDITIONS WITHOUT BREAKING. THE EXPOSED WIRE AREAS ARE NOT OF SUFFICIENT LENGTH TO REACT TO THE VIBRATIONS ENCOUNTERED DURING OPERATION (1). THIS END ITEM UNIT IS A VENDOR SUPPLIED ITEM, DRAWING SPECIFICATIONS AND MANUFACTURING PROCESSES ARE CONTROLLED BY ROCKETDYNE (1). ALL SENSOR DESIGNS ARE SUBJECTED TO A CRITICAL DESIGN REVIEW. ANY DESIGN CHANGES ARE RE-REVIEWED (1). THE ACCELEROMETER HAS PASSED ENGINE CERTIFICATION REQUIREMENT (2). HIGH CYCLE AND LOW CYCLE FATIGUE LIFE, AS WELL AS THE MINIMUM FACTORS OF SAFETY FOR THE ACCELEROMETERS, MEET CEI REQUIREMENTS (3). NO FAILURES OF THIS DESIGN HAVE OCCURED.	(1) RES7010-02 (2) RSS-8660 (3) RSS-8546, CP320900038 RL00532

CIL ITEM: J802-01		INSPECTION AND TEST	
POSSIBLE CAUSES	SIGNIFICANT CHARACTERISTICS	INSPECTION(S)/TEST(S)	DOCUMENT REF.
ALL CAUSES:	RES7010-02 - ACCELEROMETER		RES7010
	ACCEPTANCE TESTING	THE FOLLOWING TESTS ARE PERFORMED DURING MANUFACTURING AND ACCEPTANCE TESTING BY THE VENDOR:	
		- DC RESISTANCE DURING THERMAL CYCLING.	RES7010
		- INSULATION RESISTANCE BETWEEN THE CASE AND SIGNAL RETURN.	RES7010
		- CAPACITANCE MEASUREMENT (USED TO DETERMINE AXIAL SENSITIVITY).	RES7010
		- AXIAL SENSITIVITY DURING THERMAL CYCLING.	RES7010
		- TRANSVERSE SENSITIVITY AT AMBIENT TEMPERATURES.	RES7010
		- AXIAL SENSITIVITY VERSUS FREQUENCY VERIFICATION.	RES7010
		- RESONANT FREQUENCY.	RES7010
		- AXIAL SENSITIVITY AMPLITUDE LINEARITY OVER A 3000G ACCELERATION RANGE.	RES7010
		- AXIAL SENSITIVITY DURING 10,000 G HALF-SINE SHOCK.	RES7010
		- PERFORMANCE IN A HIGH HUMIDITY ENVIRONMENT BY ONE OF THE TWO FOLLOWING METHODS:	RES7010
		HUMIDITY/TEMPERATURE CYCLING	
		FINE AND GROSS LEAK TESTING	

CIL ITEM: J802-01		INSPECTION AND TEST	
POSSIBLE CAUSES	SIGNIFICANT CHARACTERISTICS	INSPECTION(S)/TEST(S)	DOCUMENT REF.
		FOLLOWING RECEIVING INSPECTION, THE ACCELEROMETERS ARE SUBJECTED TO A SPURIOUS VOLTAGE SPIKING TEST.	RL00398
	HOT FIRE ACCEPTANCE TESTING (GREEN RUN)	ALL ACCELEROMETERS USED FOR FASCOS ARE SUBJECTED TO HOT FIRE ACCEPTANCE TESTING.	RL00461
	INSTALLATION INTEGRITY	PROPER INSTALLATION IS INSPECTED PER SPECIFICATION.	RS007007
		ALL ACCELEROMETERS USED FOR THE FASCOS (ACTIVE REDLINE) SYSTEM ARE TESTED WITH THE HARNESS ASSEMBLY INSTALLED AFTER ANY MAINTENANCE OR REPAIR BY THE SIGNATURE RESPONSE TEST.	OMRSD V41AW0.050
	PRE-FLIGHT CHECKOUT	ALL ACCELEROMETER DATA FROM THE PREVIOUS FLIGHT OR GREEN RUN IS REVIEWED. ANY ANOMALOUS CONDITION NOTED REQUIRES FURTHER TESTING OR HARDWARE REPLACEMENT PRIOR TO THE NEXT FLIGHT. IN THE EVENT OF MAINTENANCE OR REPAIR, THE ABOVE CHECKOUTS ARE APPLICABLE (LAST TEST).	MSFC PLN 1228

FAILURE HISTORY: COMPREHENSIVE FAILURE HISTORY DATA IS MAINTAINED IN THE PROBLEM REPORTING DATABASE (PRAMS/PRACA).
REFERENCE: NASA LETTER SA21/88/308 AND ROCKETDYNE LETTER 88RC09761.

OPERATIONAL USE: NOT APPLICABLE.