CRITICAL ITEMS LIST

PROJECT: CARGO FLIGHT INTERFACE
ASSEMBLY: ELECTRICAL FLIGHT GRAPPLE FIXTURE

SYSTEM:
PAYLOAD GRAPPLE FIXTURE
ASSEMBLY NUMBER:
SE597E100-1

MEA REF.	REV	NAME, QTY & DRAWING REF DESIGNATION	FUNCTION	FAILURE MODE & CAUSE	MISSION PHASE	FAILURE EFFECT ON END ITEM	HARDWARE FUNCTION CRITICALITY	RATIONALE FOR ACCEPTANCE
14040	B	PIVOT SCREWS, QTY-3 P/N SE597E130-1 PIVOT SCREWS, QTY-1 P/N SE597E140-3	ATTACHES CONNECTING LINK BRACKET TO CONNECTING LINK, LEVER TO CONNECTING LINK, AND LEVER TO LEVER SLIDE ATTACHES LEVER TO FULCRUM BRACKET	MODE: LOSS OF LINKAGE CONTROL CAUSE(S): 1553MB (FAIL FROZEN) PIVOT SCREWS.	ORBIT	SHAFT MOTION RESULTS IN DEGRADED CONNECTOR MOTION, POSSIBLE EE MOTOR BURNOUT IF NO RIGID FLAG. ELECTRICAL CONNECTOR MAY NOT MATE/DEMATE WITH EE CONNECTOR UNEVEN OR DELAYED CONNECTOR SEPARATION AT EE BRACKET CAUSING UNEXPECTED PAYLOAD MOTION AT RELEASE. **WORST CASE** PAYLOAD DOES NOT RELEASE CREW ACTION REQUIRED. **TIME TO EFFECT** HOURS **REDUNDANT PATHS REMAINING** RMS JETTISON	3/1R **REDUNDANCY SCREENS** A - PASS B - PASS C - PASS	**DESIGN FEATURES** THE LEVER PIVOT SCREWS PART NUMBER SE597E130-1 AND -3, ARE MANUFACTURED FROM 123 H9 CORROSION RESISTANT STEEL PER QQ-S-763, CLASS 304, CONDITION B. THE THREADS OF THE SCREWS ARE .1900-32 UNF-2A. REFERENCE DESIGN ANALYSIS REPORT SPAR-RMS-R-1108, FOR SAFETY MARGINS OF SAFETY. SUBSEQUENT TO INSTALLATION OF THIS PART INTO THE EGF, THE FOLLOWING ACCEPTANCE TESTINGS CONDUCTED ON THE GRAPPLE FIXTURE. THE EXTENSION AND RETRACTION OF THE GRAPPLE SHAFT ASSEMBLY AND CONSEQUENTLY THE LINKAGE MOVEMENT ASSOCIATED WITH THESE SCREWS IS EXTENSIVELY EXERCISED DURING THE COURSE OF THIS TESTING. **ACCEPTANCE TESTS** THE ELECTRICAL FLIGHT GRAPPLE FIXTURE (EFGF) IS SUBJECTED TO THE FOLLOWING ACCEPTANCE TESTS (REF. SPAR-RMS-ATP-1473): - VISUAL INSPECTION AND CRITICAL DIMENSION VERIFICATION - AMBIENT FUNCTIONAL TESTS: A) MECHANICAL - GRAPPLE SHAFT OPERATION, ELECTRICAL CONNECTOR MATE/DEMATE, AND EVA SHAFT RELEASE/REINSERTION, UNDER LOAD AND NO LOAD. B) ELECTRICAL - CONTINUITY, ISOLATION RESISTANCE, DIELECTRIC STRENGTH UNDER 0 AND 3 DEG., X AND Y AXIS SEPARATION. - VIBRATION TEST: 0.04 g^2/Hz IN EACH OF X, Y, & HD Z AXIS. - VISUAL INSPECTION - STRUCTURAL ADEQUACY TEST: AXIAL LOAD = 2215 LBF - BENDING MOMENT = 1700 FT LBS. - TORSIONAL MOMENT = 450 FT. LBS. - VISUAL INSPECTION AND CRITICAL DIMENSIONS VERIFICATION - AMBIENT FUNCTIONAL TESTING - MECHANICAL - THERMAL TEST: - +84 DEG C/-62 DEG. C, TWO CYCLES - MECHANICAL FUNCTION TESTED AT TEMPERATURE EXTREMES - FUNCTIONAL TESTING - MECHANICAL AND ELECTRICAL DIMENSIONAL INSPECTION PERFORMED IN ACCORDANCE WITH SPAR-RMS-ITP-1472

PREPARED BY: AJR APPROVED BY: FMEA/CIL Working Group DATE: 8 Jun 92 QUALITY ASSURANCE DATE

[illegible] ITEMS LIST

PROJECT: CARGO ELEMENT INTERFACE
ASSEMBLY: ELECTRICAL FLIGHT GRAPPLE FIXTURE

SYSTEM:
PAYLOAD GRAPPLE FIXTURE
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[illegible]

EA REF.	REV	NAME, CITY & DRAWING REF. DESIGNATION	FUNCTION	FAILURE MODE & CAUSE	MISSION PHASE	FAILURE EFFECT ON END ITEM	HARDWARE (FUNCTION CRITICALITY	RATIONALE FOR ACCEPTANCE
[illegible] INTERFACE								

QUALIFICATION TESTS

THE EPDF QUALIFICATION CONSISTS OF PERFORMING ESSENTIALLY THE SAME TESTS AS REQUIRED FOR ACCEPTANCE TESTS WITH THEIR ASSOCIATED MECHANICAL AND ELECTRICAL FUNCTIONAL INSPECTIONS (REF. SPAR-RMS-TP-1074):

- STRUCTURAL ADEQUACY TEST:
- ATP REPEATED USING 1.25 DESIGN LOAD AND MOMENT VALUES.

- THERMAL VACUUM TEST:
- +100 DEG. C/-75 DEG. C, TEN CYCLES
- MECHANICAL FUNCTION TESTED AT TEMPERATURE EXTREMES.

-VIBRATION TEST
- RESONANCE EVALUATION AT 0.5 g
- 0.087 g^2/Hz IN EACH OF X, Y, AND Z AXIS

QA INSPECTIONS

THE EPDF IS MANUFACTURED UNDER DOCUMENTED QUALITY CONTROLS BY SPAR AND APPROVED SUBCONTRACTORS. THESE CONTROLS ARE EXERCISED THROUGH DESIGN, PROCUREMENT, PROCESSING, FABRICATION, ASSEMBLY, TESTING, SHIPPING AND RECEIVING OF UNITS. SPAR/GOVERNMENT REPRESENTATIVE MANDATORY INSPECTION POINTS ARE INVOKED ON THE SUBCONTRACTOR AT VARIOUS LEVELS OF ASSEMBLY AND TESTING.

RECEIVING INSPECTION VERIFIES THAT ALL PARTS RECEIVED ARE AS IDENTIFIED IN THE PROCUREMENT DOCUMENTS, THAT NO PHYSICAL DAMAGE TO PARTS HAS OCCURRED DURING SHIPMENT AND THAT APPROPRIATE DATA HAS BEEN RECEIVED WHICH PROVIDES ADEQUATE TRACEABILITY INFORMATION AND IDENTIFIES ACCEPTABLE PARTS.

PARTS ARE INSPECTED THROUGHOUT MANUFACTURE, ASSEMBLY AND TEST AS APPROPRIATE TO THE MANUFACTURING STAGE COMPLETED.

THESE INSPECTIONS INCLUDE:

LIQUID PENETRANT INSPECTION PER MIL-STD-6866, TYPE I, METHOD B, SENSITIVITY LEVEL 3, TO CHECK THAT NO CRACKS ARE PRESENT. VERIFICATION THAT KITTED PARTS ARE CORRECT PRIOR TO ASSEMBLY AND TRACEABILITY INFORMATION RECORDED.

INSPECTION TO DRAWING THROUGHOUT THE ASSEMBLY PROCESS.
VISUAL INSPECTION AND CRITICAL DIMENSIONAL VERIFICATION IS PERFORMED TO SPAR INSPECTION TEST PROCEDURE SPAR-RMS-TP-1075, WHICH INCLUDES GROUNDING VERIFICATION, WORKMANSHIP, DIMENSIONAL WEIGHT, (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT)

ACCEPTANCE TESTING (ATP) INCLUDES CRITICAL DIMENSIONAL CHECKS, FUNCTIONAL TESTING FOR GRAPPLE SHAFT OPERATION, ELECTRICAL MATE/DEMATE AND ELECTRICAL OPERATION, BREAKOUT AND RUNNING TORQUES FOR EVA SHAFT WITHDRAWAL AND INSERTION UNDER LOAD, PROOF LOADING AND GROUNDING TEST (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT)

PREPARED BY: R.L.R APPROVED BY: FMEA/CIL Working Group DATE: 8 Jun 92 SUPERSEDING DATE:

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[illegible] CONTINUED								

OMRSD

NONE

FAILURE HISTORY

NONE

OPERATIONAL EFFECTS

NORMAL ELECTRICAL CONNECTOR DEMATE NOT POSSIBLE

CREW ACTION

EVA DEMATING OF CONNECTOR IS POSSIBLE. PMS JETTISON IS AVAILABLE

CREW TRAINING

THE CREW WILL BE TRAINED TO EVA RELEASE THE ELECTRICAL CONNECTORS AND JETTISON THE PMS

MISSION CONSTRAINTS

OPERATE UNDER VERNIER RATES WITHIN 10 FT. OF STRUCTURE. THE ARM WILL NOT BE DRIVEN UNLESS THE CREW IS OBSERVING THE EXPECTED MOTION OF THE ARM/PAYLOAD STRUCTURE VIA WINDOW AND/OR CCTV VIEWS.

EE MODE SWITCH SET TO OFF POSITION IMMEDIATELY AFTER SPECIFIED DRIVE TIME HAS ELAPSED.

WHEN CAPTURING OR RELEASING A FREE FLYING PAYLOAD THE EE MUST BE FAR ENOUGH AWAY FROM STRUCTURE TO PROHIBIT CONTACT REGARDLESS OF PAYLOAD ROTATIONS.

PREPARED BY: AJB APPROVED BY: FMEA/CIL working group DATE: June 2, 1992 SUPERSEDING DATE: