CRITICAL ITEMS LIST

PROJECT: CARGO ELEMENT INTERFACE
ASSEMBLY: ELECTRICAL FLIGHT GRAPPLE FIXTURE

SYSTEM:
PAYLOAD GRAPPLE FIXTURE
ASSEMBLY NUMBER:
81997E106-1

FMEA REF.	REV	NAME, QTY & DRAWING REF. DESIGNATION	FUNCTION	FAILURE MODE & CAUSE	MISSION PHASE	FAILURE EFFECT ON ENDITEM	HARDWARE FUNCTION CRITICALITY	RATIONALE FOR ACCEPTANCE
04009	B	ELECTRICAL CONNECTOR, QTY-1 R/M SPAR 9045B016-102	PROVIDES ELECTRICAL POWER/DATA/SIGNAL CONTINUITY BETWEEN EE AND PAYLOAD.	MODE: FAILURE TO MAKE PROPER CONNECTION. CAUSE(S): DEBRIS IN CONNECTOR CAVITY.	ORBIT	LOSS OF ELECTRICAL POWER/DATA/SIGNAL TRANSFER BETWEEN EE AND PAYLOAD. WORST CASE SHORT BETWEEN TWO OR MORE CONTACTS DAMAGE TO SPARE ELECTRICAL SYSTEM. LOSS OF RF CAPTURE AND RELEASE CAPABILITY IN AUTO AND MANUAL, DUE TO BLOWN FUSES IN RMS SHOULDER JOINT. CREW ACTION REQUIRED. TIME TO EFFECT HOURS REDUNDANT PATHS REMAINING NONE FOR CAPTURE. 1) BACKUP RELEASE 2) RMS JETTISON	3/1/3 REDUNDANCY SCREENS A - PASS B - PASS C - PASS	DESIGN FEATURES THE PART IS ESSENTIALLY A MIL-C-83733/8 PACK TO PANEL STYLE, RECTANGULAR TYPE, RECEPTACLE CONNECTOR WITH GUIDE PINS. THE SHELL MATERIAL IS ALUMINUM ALLOY CONFORMING TO QQ-A-591. THE CONNECTOR CONTAINS REAR RELEASE, REMOVABLE CRIMP TYPE PIN CONTACTS. THEY CONFORM TO MIL-C-39029/4, AND HAVE ADDITIONAL PLATING THICKNESS. SUBSEQUENT TO INSTALLATION OF THIS PART INTO THE EFGF, THE FOLLOWING ACCEPTANCE TESTING IS CONDUCTED ON THE GRAPPLE FIXTURE. THE ELECTRICAL PERFORMANCE OF THE CONNECTOR 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-1873). THIS TESTING ALSO INCLUDES VISUAL INSPECTION OF THE CONNECTOR MATING SURFACES PRIOR TO MATING AND AFTER DEMATING. - VISUAL INSPECTION AND CRITICAL DIMENSIONS VERIFICATION - AMBIENT FUNCTIONAL TESTS A) MECHANICAL - GRAPPLE SHAFT OPERATION, ELECTRICAL CONNECTOR MATE/DEMATE, AND GFA SHAFT RELEASE/REINSTATION, UNDER LOAD AND NO LOAD. B) ELECTRICAL - CONTINUITY, ISOLATION RESISTANCE, DIELECTRIC STRENGTH UNDER 0 AND 5 DEG. X AND Y AXIS SEPARATION. - VIBRATION TEST: 0.04 g^2/Hz IN EACH OF X, Y AND Z AXIS. - VISUAL INSPECTION - STRUCTURAL ADEQUACY TEST: - AXIAL LOAD = 2213 LBF. - BENDING MOMENT = 1890 FT-LBS. - TORSIONAL MOMENT = 450 FT-LBS - VISUAL INSPECTION AND CRITICAL DIMENSIONS VERIFICATION - AMBIENT FUNCTIONAL TESTING - MECHANICAL - THERMAL TEST: - +84 DEG. F/-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-1872 QUALIFICATION TESTS THE EFGF QUALIFICATION CONSISTED OF PERFORMING ESSENTIALLY THE SAME TESTS AS REQUIRED FOR ACCEPTANCE, PLUS THE FOLLOWING ADDITIONAL TESTS WITH THEIR ASSOCIATED MECHANICAL AND ELECTRICAL FUNCTIONAL INSPECTIONS (REF. SPAR-RMS-ITP-1874): - STRUCTURAL ADEQUACY TEST: - ATP REPEATED USING 1.2K DESIGN LOAD AND MOMENT VALUES - THERMAL VACUUM TEST - +105 DEG. F/-75 DEG. C, TEN CYCLES - MECHANICAL FUNCTION TESTED AT TEMPERATURE EXTREMES. - VIBRATION TEST: - RESONANCE EVALUATION AT 4.5 g - 0.067 g^2/Hz IN EACH OF X, Y, AND Z AXIS

PREPARED BY: AB APPROVED BY: FMEA/CEL Working Group DATE: 8 Jun 92 SUPERCEDING DATE:

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ASSEMBLY: ELECTRICAL FLIGHT GRAPPLE FIXTURE

SYSTEM:
PAYLOAD GRAPPLE FIXTURE
ASSEMBLY NUMBER:
315075100-1

FMEA REF.	REV	NAME, QTY & DRAWING REF DESIGNATION	FUNCTION	FAILURE MODE & CAUSE	MISSION PHASE	FAILURE EFFECT ON END ITEM	HARDWARE /FUNCTION CRITICALITY	RATIONALE FOR ACCEPTANCE
1009 CONTINUED								see below

RATIONALE FOR ACCEPTANCE

QA INSPECTIONS

THE EFGF 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;

COMPLIANCE TO ELECTRICAL CONNECTOR SPECIFICATIONS SPAR-SG 456/01 AND SPAR-SG-L0022. THIS INCLUDES VISUAL INSPECTION, DIELECTRIC WITHSTANDING VOLTAGE, INSULATION RESISTANCE, CONTACT ENGAGEMENT AND SEPARATING FORCES.

VERIFICATION THAT KITTED PARTS ARE CORRECT PRIOR TO ASSEMBLY AND TRACEABILITY INFORMATION RECORDED.

INSPECTION TO DRAWING THROUGHOUT THE ASSEMBLY PROCESS, INCLUDING INSPECTION OF LOCKING, WITNESSING OF TORQUING AND APPLICATION OF TORQUE STRIPING.

VISUAL INSPECTION AND CRITICAL DIMENSIONAL VERIFICATION IS PERFORMED TO SPAR INSPECTION TEST PROCEDURE SPAR-RMS ITP 1073, 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)

FAILURE HISTORY

NONE

OPERATIONAL EFFECTS

POSSIBLE LOSS OF MISSION

CREW ACTION

INHIBIT ELECTRICAL SIGNALS THROUGH EE CONNECTOR

CREW TRAINING

N/A

MISSION CONSTRAINTS

N/A

PREPARED BY: A 1 R APPROVED BY: FMEA/CIL Working group DATE: 8 Jun 92 SUPERSEDING DATE: