

FORMAL ITEM LIST

PROJECT: CARGO ELEMENT INTERFACE
ASSEMBLY: ELECTRICAL FLIGHT GRAPPLE
FIXTURE

SYSTEM:
PAYLOAD GRAPPLE FIXTURE
ASSEMBLY NUMBER:
31507E100-1

ITEM NO	REV	NAME, QTY & DRAWING REF. DESIGNATION	FUNCTION	FAILURE MODE & CAUSE	MISSION PHASE	FAILURE EFFECT ON END ITEM	HARDWARE FUNCTION CRITICALITY	RATIONALE FOR ACCEPTANCE
16000	0	ELECTRICAL CABLE ASSEMBLY, QTY-1 PN 0PAR 51507A100-1	PROVIDES ELECTRICAL POWERMENT & SIGNAL CONTINUITY BETWEEN EE AND PAYLOAD.	MODE: SHORT CIRCUIT IN CABLE CAUSE: ABRASION OF CABLE ASSEMBLY	ORBIT	LOSS OF ELECTRICAL POWER/DATA/SIGNAL TRANSFER BETWEEN EE AND PAYLOAD <u>Worst Case</u> SHORT BETWEEN TWO OR MORE CONDUCTORS DAMAGE TO EE/MS ELECTRICAL SYSTEM LOSS OF EE CAPTURE AND RELEASE CAPABILITY IN AUTO AND MANUAL DUE TO BLOWN FUSES IN RMS SHOULDER JOINT CREW ACTION REQUIRED <u>TIME TO EFFECT</u> HOURS <u>REDUNDANT PATHS REMARKS</u> NONE FOR CAPTURE 1) BACKUP RELEASE 2) RMS ATTISON	315 <u>REDUNDANCY</u> <u>CRITICAL</u> A - PASS B - PASS C - PASS	<u>DESIGN FEATURES</u> THE CABLE ASSEMBLY IS MANUFACTURED USING MIL-R-22750/11 SILVER COATED COPPER CONDUCTORS WITH EXTRUDED TFE INSULATION AND MIL-C-27506 SHIELDING CABLE WHICH UTILIZES THE SAME CONDUCTOR TYPE. SUBSEQUENT TO INSTALLATION OF THIS PART INTO THE EPDF, THE FOLLOWING ACCEPTANCE TESTING IS CONDUCTED ON THE GRAPPLE FIXTURE. THE ELECTRICAL PERFORMANCE OF THE CABLE ASSEMBLY IS EXTENSIVELY EXERCISED DURING THE COURSE OF THIS TESTING. <u>ACCEPTANCE TESTS</u> THE ELECTRICAL FLIGHT GRAPPLE FIXTURE (EPDF) IS SUBJECTED TO THE FOLLOWING ACCEPTANCE TESTS (REF 0PAR-RMS-17-015): THE TESTING ALSO INCLUDES VISUAL INSPECTION OF THE CONNECTOR MATING SURFACES PRIOR TO MATING AND AFTER DEMATING. - VISUAL INSPECTION AND CRITICAL DIMENSION VERIFICATION - AMBIENT FUNCTIONAL TESTS A) MECHANICAL - GRAPPLE SHAFT OPERATIONAL, ELECTRICAL CONNECTOR MATE & DEMATE, AND EVA SHAFT RELEASE/FREE OPTION, UNDER LOAD AND NO LOAD. B) ELECTRICAL - CONTINUITY, ISOLATION RESISTANCE, DIELECTRIC STRENGTH UNDER X AND Z AXIS SEPARATION. - VIBRATION TEST: 0.04 g ² /Hz IN EACH OF X, Y, AND Z AXES. - VISUAL INSPECTION - STRUCTURAL RESONANCE TEST: - AXIAL LOAD = 2214 LBS - BENDING MOMENT = 1300 FT-LBS - TORSIONAL MOMENT = 450 FT-LBS - VISUAL INSPECTION AND CRITICAL DIMENSIONS VERIFICATION - AMBIENT FUNCTIONAL TESTING - MECHANICAL - THERMAL TEST: - 150 DEG C, 150 DEG C, TWO CYCLES - MECHANICAL FUNCTION TESTED AT TEMPERATURE EXTREMES. - FUNCTIONAL TESTING - MECHANICAL AND ELECTRICAL - DIMENSIONAL INSPECTION PERFORMED IN ACCORDANCE WITH 0PAR-RMS-17-015. <u>QUALIFICATION TESTS</u> THE EPDF QUALIFICATION CONSISTED OF PERFORMING 5560 HOURS THE SAME TESTS AS REQUIRED FOR ACCEPTANCE, PLUS THE FOLLOWING ADDITIONAL TESTS WITH THEIR ASSOCIATED MECHANICAL AND ELECTRICAL FUNCTIONAL INSPECTIONS (REF 0PAR-RMS-17-015): STRUCTURAL RESONANCE TEST: ATP REPEATED UNDER 1.7X DESIGN LOAD AND MOMENT (44) LBS THERMAL VACUUM TEST: - 150 DEG C, 150 DEG C, TEN CYCLES - MECHANICAL FUNCTION TESTED AT TEMPERATURE EXTREMES. - VIBRATION TEST: - RESONANCE EVALUATION AT 0.1 Hz - 0.047 g ² /Hz IN EACH OF X, Y, AND Z AXES

GF - 77

APB

FMEA/CIL

21 Jan 97

CRITICAL ITEMS LIST

PROJECT: CANOE ELEMENT INTERFACE
 ASSEMBLY: ELECTRICAL FLIGHT GRAPPLE
 FIXTURE

SYSTEM:
 PAYLOAD GRAPPLE FIXTURE
 ASSEMBLY NUMBER
 S1587100-1

FMEA REF	REV	NAME, CITY & DRAWING REF DESIGNATION	FUNCTION	FAILURE MODE & CAUSE	MISSION PHASE	FAILURE EFFECT ON END ITEM	HARDWARE FUNCTION CRITICALITY	RATIONALE FOR ACCEPTANCE
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13080
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QUALIFICATION

THE EP02 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 INVOCKED 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:

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

COMPLIANCE TO CABLE HARNESS INSPECTION TEST PROCEDURE (TP-251) FOR VISUAL INSPECTION, LEAKAGE RESISTANCE, ELECTRICAL CONTINUITY AND RESISTANCE, AND PROPER WIRE CRIMPING.

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

VISUAL INSPECTION AND CRITICAL DIMENSIONAL VERIFICATION IS PERFORMED TO SPAR INSPECTION TEST PROCEDURE SPAR-IMS-ITA-1872, WHICH INCLUDES GOVERNING VERIFICATION, WORKMANSHIP, DIMENSIONAL, WEIGHT, SPAR GOVERNMENT REP. MANDATORY INSPECTION POINTS.

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

CMR

NONE

FAILURE HISTORY

NONE

OPERATIONAL EFFECTS

POSSIBLE LOSS OF MISSION

CREW ACTION

INHIBIT ELECTRICAL SIGNALS THROUGH EE CONNECTOR.

CREW TRAINING

NA

MISSION CONSTRAINTS

NA

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FMEA/CIL
 Validation complete

21 Jun 97

11A