

CRITICAL ITEMS LIST

PROJECT: SRMS

ASS'Y NOMENCLATURE: LDEF RIG. SENSING G.F

SYSTEM: PAYLOAD GRAPPLE FIXTURE

ASS'Y P/N: 51404F1

SHEET: 1

FMEA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWQR / FUNC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10180	3	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/N HAS 1134E2	<p>MODE: LOSS OF EE RIGIDIZE FORCE.</p> <p>CAUSE(S): FAILURE OF TIP RETAINING SCREW OR INSERT.</p>	<p>PAYLOAD RELEASED.</p> <p>WORST CASE UNCOMMANDED RELEASE. CREW ACTION REQUIRED.</p> <p>REDUNDANT PATHS REMAINING</p> <p>W/A</p>	<p>DESIGN FEATURES</p>	<p>THE GRAPPLE TIP RETAINING SCREW .250-28 UNF-3A P/N HAS 1134E2 IS A BOUGHT OUT PART AND MANUFACTURED FROM 160-180 KSI CORROSION RESISTANT STEEL PER AMS 5737 (A286). THE INTERNAL LOCKING HELICOL INSERT P/N HS 21209-F4-10L IS A BOUGHT OUT PART AND MANUFACTURED FROM CORROSION RESISTANT STEEL MIL-L-6846. THE THREADS OF THE INSERT ARE DRY FILM LUBRICATED PER MIL-L-8937 TO PREVENT GALLING OF THE RETAINING SCREW THREADS. REF. TABLE 16 FOR FRGF MARGINS OF SAFETY.</p>

PREPARED BY: MFWG

SUPERVISING DATE: 30 OCT 86

APPROVED BY:

DATE:

GF-42

CRITICAL ITEMS LIST

PROJECT: SRNS

ASS'Y NOMENCLATURE: LDEF RIG. SENSING G.F.

SYSTEM: PAYLOAD GRAPPLE FIXTURE

ASS'Y P/N: 51604F1

SHEET: 2

FMEA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	DOWN ? FUNC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10180	3	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/W MAS 1134E2	<p>MODE: LOSS OF EE RIGIDIZE FORCE.</p> <p>CAUSE(S): FAILURE OF TIP RETAINING SCREW OR INSERT.</p>	<p>PAYLOAD RELEASED.</p> <p>WORST CASE UNCOMMANDED RELEASE. CREW ACTION REQUIRED.</p> <p>REDUNDANT PATHS REMAINING N/A</p>		<p>ACCEPTANCE TESTS</p> <p>THE LDEF RIGIDIZE SENSING GRAPPLE FIXTURE IS SUBJECTED TO THE FOLLOWING ACCEPTANCE TESTS (REF. SPAR-ATP-609) GRAPPLE ONLY.</p> <p>Q VISUAL INSPECTION AND DIMENSIONAL VERIFICATION</p> <p>Q PRE PROOF LOAD INSPECTION</p> <p>Q WORK-UP AND INSTALLATION OF THE COMPRESSION SPRING</p> <p>Q AMBIENT FUNCTIONAL TESTING</p> <p>Q PROOF LOAD TEST: AMBIENT CONDITIONS, BENDING MOMENT = 1200 FT.LBF. CORRESPONDING AXIAL LOAD = 2215 LBF. TORSIONAL LOAD = 450 FT.LBF.</p> <p>Q POST PROOF LOAD INSPECTION</p> <p>Q VISUAL INSPECTION AND DIMENSIONAL VERIFICATION</p> <p>Q AMBIENT FUNCTIONAL</p> <p>Q THERMAL ADEQUACY: THERMAL +93 DEGREE C (200 DEGREE F) TO -80 DEGREE C (-112 DEGREE F). TWO CYCLES AMBIENT PRESSURE.</p> <p>OPERATIONAL TESTS ARE CONDUCTED AT THE EXTREMITIES OF THE ABOVE ENVIRONMENT AT THE FOLLOWING OPERATIONAL LOAD. AXIAL GRAPPLE SHAFT LOAD = 700 LBF. MAX.</p> <p>Q POST THERMAL TEST</p> <p>Q VISUAL INSPECTION AND DIMENSIONAL VERIFICATION</p> <p>QUALIFICATION TESTS</p> <p>QUALIFICATION OF THE LDEF (RSGF) IS BY ANALYSIS SEE ANALYSIS REPORT SPAR-RMS-R.624</p> <p>OPERATIONAL TESTS</p> <p>FLIGHT CHECKOUT</p>

CRITICAL ITEMS LIST

PROJECT: SRMS
 ASS'Y NOMENCLATURE: LOEF RTG. SENSING G.F

SYSTEM: PAYLOAD GRAPPLE FIXTURE
 ASS'Y P/N: 51A06FT SHEET: 3

P/N REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	RISK / CONC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10180	3	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/N NAS 1134E2	MODE: LOSS OF EE RIGIDIZE FORCE. CAUSE(S): FAILURE OF TIP RETAINING SCREW OR INSERT.	PAYLOAD RELEASED. WORST CASE UNCOMMANDED RELEASE. CREW ACTION REQUIRED. REDUNDANT PATHS REMAINING N/A	QA/INSPECTIONS -----	<p>GRAPPLE FIXTURES ARE MANUFACTURED UNDER DOCUMENTED QUALITY CONTROLS BY A SPAR APPROVED SUBCONTRACTOR. THESE CONTROLS ARE EXERCISED THROUGH DESIGN PROCUREMENT, PLANNING, PROCESSING, FABRICATION, ASSEMBLY, TESTING, SHIPPING AND RECEIVING OF UNITS. SPAR/GOVERNMENT REPRESENTATIVE MANDATORY INSPECTION POINTS ARE ENVOCKED ON THE SUBCONTRACTOR AT VARIOUS LEVELS OF ASSEMBLY AND TESTING.</p> <p>THE GRAPPLE TIP RETAINING SCREW PART NO. NAS1134E2 IS A STANDARD. 25 .250-28UNF3A PAN HEAD TORQUE SCREW PROCURED TO NASA SPEC NAS-1134.</p> <p>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.</p> <p>PARTS ARE INSPECTED THROUGHOUT MANUFACTURE, ASSEMBLY AND TEST AS APPROPRIATE TO THE MANUFACTURING STAGE COMPLETED. THESE INSPECTIONS INCLUDE:</p> <p>INSPECTION VERIFIES THAT KITTED PARTS ARE CORRECT PRIOR TO ASSEMBLY AND TRACEABILITY INFORMATION RECORDED.</p> <p>INSPECTION TO DRAWING IS CONDUCTED THROUGHOUT THE ASSEMBLY PROCESS, INCLUDING INSPECTION OF LOCKING, WITNESSING OF TORQUING AND APPLICATION OF TORQUE STRIPING.</p> <p>VISUAL INSPECTION AND CRITICAL DIMENSIONAL VERIFICATION IS PERFORMED TO SPAR INSPECTION TEST PROCEDURE SPAR-RMS-ITP 306 WHICH INCLUDES GRINDING VERIFICATION, WORKMANSHIP, DIMENSIONAL, WEIGHT, (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT)</p> <p>ACCEPTANCE TESTING (ATP) INCLUDES DIMENSIONAL CHECKS, BREAKOUT AND RUNNING TORQUES, WITHDRAWAL AND INSERTION LOADS, PROOF LOADING, FUNCTIONAL TESTING AND GRINDING TEST. (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT).</p>

PREPARED BY: M/WG

SUPERSEDING DATE: 30 OCT 86

APPROVED BY:

DATE:

cit-49

CRITICAL ITEMS LIST

PROJECT: SRMS
 ASS'Y NOMENCLATURE: LIF RIG. SENSING G.F

SYSTEM: PAYLOAD GRAPPLE FIXTURE
 ASS'Y P/N: 51404F1

SHEET: 4

P/N & REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOWR / FUNC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10180	3	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/N MAS 1134E2	MODE: LOSS OF EE RIGIDIZE FORCE. CAUSE(S): FAILURE OF TIP RETAINING SCREW OR INSERT.	PAYLOAD RELEASED. WORST CASE UNCOMMANDED RELEASE. CREW ACTION REQUIRED. REDUNDANT PATHS REMAINING N/A	FAILURE HISTORY ----- NONE	

CRITICAL ITEMS LIST

PROJECT: SRMS
 ASS'Y NOMENCLATURE: LOEF RIG. SENSING G.F

SYSTEM: PAYLOAD GRAPPLE FIXTURE
 ASS'Y P/N: 51404F1

SHEET: 5

PNEA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOMR / PURC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10180	3	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/M NAS 1134E2	MODE: LOSS OF EE RIGIDIZE FORCE. CAUSE(S): FAILURE OF TIP RETAINING SCREW OR INSERT.	PAYLOAD RELEASED. WORST CASE UNCOMMANDED RELEASE. CREW ACTION REQUIRED. REDUNDANT PATHS REMAINING N/A		OPERATIONAL EFFECTS ----- PAYLOAD WILL BE RELEASED WITHOUT AN OPERATOR COMMAND. UNCOMMANDED RELEASE WILL BE ANNUNCIATED. IF THIS OCCURS WHILE THE ARM IS BEING DRIVEN, THE PAYLOAD WILL TAKE AN UNEXPECTED TRAJECTORY. DURING CAPTURE SEQUENCE ARM REMAINS LIMP UNTIL EE MODE SWITCH SET TO OFF. CREW ACTION ----- MANEUVER ARM AND ORBITER AWAY FROM PAYLOAD. CREW TRAINING ----- THE CREW WILL BE TRAINED TO MANEUVER THE ORBITER AWAY FROM A FREE FLYING PAYLOAD AT ANY TIME DURING ARM OPERATIONS. MISSION CONSTRAINT ----- 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 SPEC DRIVE TIME HAS ELAPSED. WHEN CAPTURING A FREE FLYING PAYLOAD, THE EE MUST BE FAR ENOUGH AWAY FROM STRUCTURE TO PROHIBIT CONTACT REGARDLESS OF PAYLOAD ROTATIONS. SCREEN FAILURES ----- N/A

PREPARED BY: HMG

SUPERSEDING DATE: 30 OCT 86

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DATE:

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