

CRITICAL ITEMS LIST

PROJECT: SRMS
 ASS'Y NOMENCLATURE: RIGIDIZE SENSING G.F.

SYSTEM: PAYLOAD GRAPPLE FLTURE
 ASS'Y P/N: 51524F1-183 SHEET: 1

P/N & REV.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWY / FUNC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10040	0	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/N WAS 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	DESIGN FEATURES	THE GRAPPLE TIP RETAINING SCREW .250-28 UNF-3A P/N WAS 1134E2 IS A BOUGHT OUT PART AND MANUFACTURED FROM 160-180 KSI CORROSION RESISTANT STEEL PER AMS 5737 (A286). THE INTERNAL LOCKING HELICOIL INSERT P/N WS 21209-F4-10L IS A BOUGHT OUT PART AND MANUFACTURED FROM CORROSION RESISTANT STEEL MIL-1-6845. THE THREADS OF THE INSERT ARE DRY FILM LUBRICATED PER MIL-L-8937 TO PREVENT GALLING OF THE RETAINING SCREW THREADS. REF. TABLE 36 FOR FRG MARGINS OF SAFETY.

PREPARED BY: MILN

SUPPLEMENTING DATE: 11 SEP 85

APPROVED BY:

DATE:

CRITICAL ITEMS LIST

PROJECT: SRMS
 ASS'Y NOMENCLATURE: RIGIDIZE SENSING G.F.

SYSTEM: PAYLOAD GRAPPLE FIXTURE
 ASS'Y P/N: 51574FT-183

SHEET: 2

THEA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT OR END ITEM	HDMR / FUNC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10040	0	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/N HAS 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		ACCEPTANCE TESTS ----- THE RSGF IS SUBJECTED TO THE FOLLOWING ACCEPTANCE TESTS (REF. SPAR ATP. 1004) O WORK-IN AND INSTALLATION OF THE COMPRESSION SPRING O VISUAL INSPECTION AND DIMENSIONAL VERIFICATION O PREPROOF LOAD INSPECTION O AMBIENT FUNCTIONAL O PROOF LOAD TEST: AMBIENT CONDITIONS. BENDING MOMENT = 1200 FT.LBF. CORRESPONDING AXIAL LOAD = 2215 LBF. TORSIONAL LOAD = 450 FT.LBF. O VISUAL INSPECTION AND DIMENSIONAL VERIFICATION (POST PROOF LOAD) O THERMAL ADEQUACY: THERMAL +93 DEGREE C (200 DEGREE F) TO -80 DEGREE C (-112 DEGREE F). TWO CYCLES AMBIENT PRESSURE. OPERATIONAL TESTS ARE CONDUCTED AT THE EXTREMITIES OF THE ABOVE ENVIRONMENT AT THE FOLLOWING OPERATIONAL LOAD. AXIAL GRAPPLE SHAFT LOAD = 700 LBF. MAX. O FUNCTIONAL EVA RELEASE TEST QUALIFICATION TESTS ----- QUALIFICATION OF THE RSGF IS BY ANALYSIS SEE ANALYSIS REPORT SPAR-RMS-R 624 OPERATIONAL TESTS ----- FLIGHT CHECKOUT -----

CRITICAL ITEMS LIST

PROJECT: SRMS

SYSTEM: PAYLOAD GRAPPLE FIXTURE

ASS'Y NOMENCLATURE: RIGIDIZE SENSING G.F.

ASS'Y P/N: 215741-183

SHEET: 3

FMEA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWR / FUNC. (1) CRITICALITY	RATIONALE FOR ACCEPTANCE
1004B	0	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/N NAS 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</p> <p>UNCOMMANDED RELEASE. CREW ACTION REQUIRED.</p> <p>REDUNDANT PATHS REMAINING</p> <p>N/A</p>	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 EVOKED ON THE SUBCONTRACTOR AT VARIOUS LEVELS OF ASSEMBLY AND TESTING.</p> <p>THE GRAPPLE TIP RETAINING SCREW PART NO. NAS1134E2 IS A STANDARD .250-20UNF3A 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 GROUNDING 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 GROUNDING TEST. (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT).</p>

PREPARED BY: MIWG

SUPERSEDING DATE: 11 SEP 80

APPROVED BY:

DATE:

6/14

CRITICAL ITEMS LIST

PROJECT: SRMS
 ASS'Y NOMENCLATURE: RIGIDIZE SENSING G.F.

SYSTEM: PAYLOAD GRAPPLE FIXTURE
 ASS'Y P/N: 51574F1-1B3 SHEET: 4

FMEA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWR / FUNC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10040	0	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/N HAS 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	

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PROJECT: SRMS

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SHEET: 5

FMEA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWR / FUNC. 1/1 CRITICALITY	RATIONALE FOR ACCEPTANCE
10040	D	GRAPPLE TIP RETAINING ASSEMBLY QTY-1 P/N NAS 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>N/A</p>		<p>OPERATIONAL EFFECTS</p> <p>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.</p> <p>CREW ACTION</p> <p>MANEUVER ARM AND ORBITER AWAY FROM PAYLOAD.</p> <p>CREW TRAINING</p> <p>THE CREW WILL BE TRAINED TO MANEUVER THE ORBITER AWAY FROM FREE FLYING PAYLOAD AT ANY TIME DURING ARM OPERATIONS.</p> <p>MISSION CONSTRAINT</p> <p>OPERATE UNDER VENTER RATES WITHIN 10 FT. OF STRUCTURE. THE ARM WILL NOT BE DRIVEN UNLESS THE CREW IS OBSERVING THE EXPL. LD MOTION OF THE ARM/PAYLOAD STRUCTURE VIA WINDOW AND/OR CCTV VIEWS.</p> <p>EE MODE SWITCH SET TO OFF POSITION IMMEDIATELY AFTER SPEC DRIVE TIME HAS ELAPSED.</p> <p>WHEN CAPTURING A FREE FLYING PAYLOAD, THE EE MUST BE FAR ENOUGH AWAY FROM STRUCTURE TO PROHIBIT CONTACT REGARDLESS OF PAYLOAD ROTATIONS.</p> <p>SCREEN FAILURES</p> <p>N/A</p>

PREPARED BY: MFNG

SUPERSEDING DATE: 11 SEP 86

APPROVED BY:

DATE:

Gp-11a