

CRITICAL ITEMS LIST

PROJECT: SPMS
 ASS'Y NOMENCLATURE: LDEF RIGIDIZE SENSING G.F

SYSTEM: PAYLOAD GRAPPLE FIXTURE
 ASS'Y P/N: 51404E1 SHEET: 1

P/N REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWR / FUNC. 2/2 CRITICALITY	RATIONALE FOR ACCEPTANCE
10190	5	GRAPPLE SHAFT RETURN SPRING. QTY-1 SPAR 51404D109	MODE: SHAFT FAILS TO RETRACT AFTER EE DERIGIDIZA- TION. CAUSE(S): BROKEN SPRING.	LOSS OF PAYLOAD ACTUATION/ DEACTUATION DEVICE. WORST CASE LOSS OF MISSION. REDUNDANT PATHS REMAINING N/A	DESIGN FEATURES	THE COMPRESSION SPRING P/N 51404D109 IS A BOUGHT OUT ITEM, MANUFACTURED FROM SAE 6150 STEEL IN ACCORDANCE WITH ASTM 232 SPECIFICATION. HEAT TREATMENT PER MIL-A-6875, SHOT PEENING PER MIL-F-13165 AND MAGNAFLUX INSPECTION TO MIL-I-6868 ARE OTHER CERTIFICATIONS UNDER WHICH THE SPRING IS PROCURED. PRIOR TO ITS INSTALLATION TO THE GRAPPLE FIXTURE, EACH SHAFT RETURN SPRING IS SUBJECTED TO THE FOLLOWING WORK-IN TESTS UNDER AMBIENT CONDITIONS: 200 COMPRESSION CYCLES AT MAX OPERATION LOADS OF 675 LBF. FOLLOWING INSTALLATION OF THE SHAFT RETURN SPRING INTO THE GRAPPLE FIXTURE, THE FOLLOWING OPERATIONAL ACCEPTANCE TESTING IS CONDUCTED ON THE GRAPPLE FIXTURE.

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PMA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HWR / FUNC. 2/2 CRITICALITY	RATIONALE FOR ACCEPTANCE
10190	5	GRAPPLE SHAFT RETURN SPRING. QTY-1 SPAR 51404D109	MODE: SHAFT FAILS TO RETRACT AFTER EE DELIGIDIZATION. CAUSE(S): BROKEN SPRING.	LOSS OF PAYLOAD ACTUATION/ DEACTUATION DEVICE. WORST CASE ----- LOSS OF MISSION. REDUNDANT PATHS REMAINING ----- N/A	ACCEPTANCE TESTS ----- 2/2	<p>THE LDEF RIGIDIZE SENSING GRAPPLE FIXTURE IS SUBJECTED TO THE FOLLOWING ACCEPTANCE TESTS (REF.SPAN-ATP-609) GRAPPLE ONLY.</p> <ul style="list-style-type: none"> <input type="checkbox"/> VISUAL INSPECTION AND DIMENSIONAL VERIFICATION <input type="checkbox"/> PRE PROOF LOAD INSPECTION <input type="checkbox"/> WORK-IN AND INSTALLATION OF THE COMPRESSION SPRING <input type="checkbox"/> AMBIENT FUNCTIONAL TESTING <input type="checkbox"/> PROOF LOAD TEST: AMBIENT CONDITIONS. BENDING MOMENT = 1200 FT.LBF. CORRESPONDING AXIAL LOAD = 2215 LBF. TORSIONAL LOAD = 450 FT.LBF. <input type="checkbox"/> POST PROOF LOAD INSPECTION <input type="checkbox"/> VISUAL INSPECTION AND DIMENSIONAL VERIFICATION <input type="checkbox"/> AMBIENT FUNCTIONAL <input type="checkbox"/> THERMAL ADEQUACY: THERMAL +93 DEGREE C (200 DEGREE F) TO -80 DEGREE C (-112 DEGREE F). TWO CYCLES AMBIENT PRESSURE. <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> <ul style="list-style-type: none"> <input type="checkbox"/> POST THERMAL TEST <input type="checkbox"/> VISUAL INSPECTION AND DIMENSIONAL VERIFICATION <p>QUALIFICATION TESTS -----</p> <p>QUALIFICATION OF THE LDEF (CRSGF) IS BY ANALYSIS SEE ANALYSIS REPORT SPAR-RHS-R.624</p> <p>OPERATIONAL TESTS -----</p> <p>FLIGHT CHECKOUT -----</p>

PREPARED BY: MEWJ

SUPERSEDING DATE: 30 OCT 86

APPROVED BY: _____

DATE: _____

GH AE

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SHEET: 3

FMEA REF.	REV.	NAME, QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	HOUR / FUNC. 2/2 CRITICALITY	RATIONALE FOR ACCEPTANCE
10190	5	GRAPPLE SHAFT RETURN SPRING. QTY-1 SPAR 51404D109	MODE: SHAFT FAILS TO RETRACT AFTER EE DERIGIDIZATION. CAUSE(S): BROKEN SPRING.	LOSS OF PAYLOAD ACTUATION/ DEACTUATION DEVICE. WORST CASE ----- LOSS OF MISSION. 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 ENVOIKED ON THE SUBCONTRACTOR AT VARIOUS LEVELS OF ASSEMBLY AND TESTING.</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>

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SHEET: 4

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10190	5	GRAPPLE SHAFT RETURN SPRING. QTY-1 SPAR 51404D309	MODE: SHAFT FAILS TO RETRACT AFTER EE DERIGIDIZATION. CAUSE(S): BROKEN SPRING.	LOSS OF PAYLOAD ACTUATION/ DEACTUATION DEVICE. WORST CASE LOSS OF MISSION. REDUNDANT PATHS REMAINING N/A	FAILURE HISTORY NONE	

PREPARED BY: MMG

SUPERSEDING DATE: 30 OCT 86

APPROVED BY: _____

DATE: _____

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FMEA REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT OR END ITEM	HOW / FUNC. 2/2 CRITICALITY	RATIONALE FOR ACCEPTANCE
10190	5	GRAPPLE SHAFT RETURN SPRING. QTY-1 SPAB 51404B109	MODE: SHAFT FAILS TO RETRACT AFTER EE DERIGIDIZATION. CAUSE(S): BROKEN SPRING.	LOSS OF PAYLOAD ACTUATION/ DEACTUATION DEVICE. WORST CASE LOSS OF MISSION. REDUNDANT PATHS REMAINING N/A		OPERATIONAL EFFECTS ----- CREW ACTION ----- MISSION CONSTRAINT ----- SCREEN FAILURES ----- N/A ----- OMRSD OFFLINE ----- VISUAL INSPECTION OMRSD ONLINE (INSATALLATION) ----- VISUAL INSPECTION ----- OMRSD ONLINE TURKAROUND ----- VISUAL INSPECTION