

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTIVE THERMAL CONTROL FMEA NO 06-3D -0580 -1 REV:08/28/
ASSEMBLY : CRIT. FUNC: 1F
P/N RI : V070-634666-009 CRIT. HDW: 2
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 4 EFFECTIVITY: X X X
: FOUR, TWO PER PHASE(S): PL LO X CO X DO X LS
: F-21 LOOP

REDUNDANCY SCREEN: A-PASS B-PASS C-PAS
PREPARED BY: APPROVED BY: APPROVED BY (NASA):
DES O. TRAN DES *[Signature]* SSM *[Signature]*
REL D. RISING REL *[Signature]* REL *[Signature]*
QE W. SMITH QE *[Signature]* QE *[Signature]*

ITEM:

CONTAINER ASSEMBLY, FLEX HOSE RETRACTION & STORAGE.

FUNCTION:

RETRACT AND STORE FREON FLEXIBLE HOSE ASSEMBLIES DURING OPENING AND CLOSING OF PAYLOAD BAY DOOR ASSEMBLIES.

FAILURE MODE:

EXTERNAL LEAKAGE OF FLEXHOSE ASSEMBLY.

CAUSE(S):

MECHANICAL SHOCK, VIBRATION, POROSITY, PHYSICAL BINDING/JAMMING, CORROSION.

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A, B) LOSS OF FREON FROM ONE FREON COOLANT LOOP FOR VEHICLE COOLING.

(C) POSSIBLE LOSS OF MISSION. EARLY MISSION TERMINATION FOR FIRST FAILURE.

(D) SECOND ASSOCIATED FAILURE (LOSS OF REDUNDANT FREON COOLANT LOOP) WILL CAUSE LOSS OF ALL VEHICLE COOLING AND MAY RESULT IN LOSS OF CREW/VEHICLE

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A) DESIGN

DESIGN SAFETY FACTOR - PROOF PRESSURE OF 2.0 AND BURST PRESSURE OF 4.0 TIMES MAXIMUM OPERATING PRESSURE. BRAZED FLEX TUBE IS A ME271-0089-101 WITH WALL THICKNESS OF .025, MADE OF STAINLESS STEEL WHICH IS COMPATIBLE WITH FREON AND CORROSION RESISTANT. HOSE GUIDES AND REEL PREVENTS BINDING.

(B) TEST

QUALIFICATION TEST - QUALIFICATION TESTED FOR A 100 MISSION LIFE. LIFE CYCLE TESTED DURING QUALIFICATION FOR 1000 CYCLES. VIBRATION TESTED AT 0.4 G²/HZ FOR 48 MIN/AXIS, SHOCK TESTED AT +/- 20 G EACH AXIS.

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ACCEPTANCE TEST - ACCEPTANCE TEST INCLUDES LEAK CHECK OF COMPONENTS.

OMRSD - FCL'S ARE LEAK-CHECKED PRIOR TO EACH FLIGHT. SYSTEM CHECKOUT USING VEHICLE INSTRUMENTATION TO DETECT LEAKAGE. FREON CHEMICAL ANALYSIS PER SE-5-0073 DURING SERVICING.

(C) INSPECTION

RECEIVING INSPECTION

MATERIALS AND PROCESS CERTIFICATIONS VERIFIED BY INSPECTION.

CONTAMINATION CONTROL

SYSTEM FLUID SAMPLES PERIODICALLY ANALYZED FOR CONTAMINATION AND VERIFIED BY INSPECTION. CORROSION PROTECTION PER APPLICABLE SPECIFICATION IS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

PROCESSING EQUIPMENT CONTROLS ARE VERIFIED BY INSPECTION. MANUFACTURING INSTALLATION AND ASSEMBLY OPERATIONS ARE VERIFIED BY INSPECTION. INSTALLATION OF THREADED PASTENERS IS VERIFIED BY INSPECTION.

CRITICAL PROCESSES

BRAZING IS VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION

X-RAY OF BRAZED JOINTS IS VERIFIED BY INSPECTION. LEAK TEST IS VERIFIED BY INSPECTION.

TESTING

ATP IS VERIFIED BY INSPECTION, INCLUDING VISUAL INSPECTION FOR DAMAGE.

HANDLING/PACKAGING

HANDLING AND PACKAGING REQUIREMENTS ARE VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

NO FAILURE HISTORY.

(E) OPERATIONAL USE

ON-BOARD ALARMS, FREON INLET PRESSURE AND ACCUMULATOR QUANTITY, WILL PROVIDE INDICATION OF HARDWARE FAILURE. FREON PUMP WILL BE TURNED OFF AND LOSS OF ONE FREON LOOP POWERDOWN WILL BE PERFORMED. ENTRY AT NEXT PRIMARY LANDING SITE.