

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTIVE THERMAL CONTROL FMEA NO 06-3D -0580 -4 REV:06/29/
ASSEMBLY : CRIT. FUNC: 2
P/N RI : V070-614666-009 CRIT. HDW: 2
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 4 EFFECTIVITY: X X X
: FOUR, TWO PER PHASE(S): PL LO OO X DO LS
: P-21 LOOP)

PREPARED BY: REDUNDANCY SCREEN: A- B- C-
DES O. TRAN DES APPROVED BY: APPROVED BY (NASA):
REL D. RISING REL SSM
QE W. SMITH QE REL
(Handwritten signatures and initials are present over the printed names and approval lines.)

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:
RESTRICTED FLOW DURING RADIATOR DEPLOYMENT.

CAUSE(S):
KINKING OF HOSE ASSEMBLY, CONTAMINATION.

EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
(A, B) POSSIBLE LOSS OF RADIATOR FLOW IN ONE FREON LOOP FOR VEHICLE COOLING THROUGH THE RADIATORS.
(C) POSSIBLE LOSS OF MISSION DUE TO THE LOSS RADIATOR COOLING TO SUPPORT PAYLOAD OPERATIONS.
(D) NO EFFECT.
(E) FUNCTIONAL CRITICALITY EFFECT - ANY TWO ADDITIONAL FAILURES (OTHER FREON COOLANT LOOP, HI-LOAD EVAPORATOR, AND AMMONIA BOILER SYSTEM) WILL CAUSE LOSS OF VEHICLE COOLING CAPABILITY 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 FEATURE - HOSE GUIDES AND REEL PREVENT KINKING. FLEX TUBE IS 3/4 IN DIAMETER. FILTRATION PROVISIONS MINIMIZE CONTAMINATION - 25 AND 61 MICRON FILTERS IN THE PUMP PACKAGE, 65 MICRON FILTER IN THE FLOW CONTROL ASSEMBLY.

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(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.

ACCEPTANCE TEST - ATP VERIFIES PRESSURE DROP THROUGH COMPONENTS.

OMRSD - FCL FLOW RATES ARE CHECKED PRIOR TO EACH FLIGHT. FREON CHEMICAL ANALYSIS PER SE-S-0073 DURING SERVICING. FREON IS SERVICED THROUGH A FINAL FILTER OF 25 MICRON (ABS) SIZE.

(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 TREADED FASTENERS 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 ALARM, FREON FLOW, WILL PROVIDE INDICATION OF HARDWARE FAILURE. LOSS OF RADIATOR WILL CAUSE AN EARLY END OF MISSION. RADIATOR WILL BE BYPASSED, FREON PUMP WILL BE TURNED OFF, AND A POWERDOWN WILL BE PERFORMED. FREON PUMP WILL BE REACTIVATED FOR ENTRY.