1 PRINT DATE: 02/17/8

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-1B3-0571-X

SUBSYSTEM NAME: ARS - COOLING

REVISION : 0 02/17/89 W

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	LINES AND FITTINGS	V070-613890
LRU	:	LINES AND FITTINGS	V070-613891
LRU	:	LINES AND FITTINGS	V070-613896
LRU	:	LINES AND FITTINGS	V070-634460

QUANTITY OF LIKE ITEMS: 2
ONE SET PER LOOP
TWO SETS PER SUBSYSTEM

DESCRIPTION/FUNCTION:
LINES AND FITTINGS

PROVIDES FOR THE MOVEMENT OF THE WATER BETWEEN THE VARIOUS HEAT EXCHANGERS FOUND WITHIN THE ARS.

2

PRINT DATE: 02/17/8

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-1B3-0571-01

REVISION: 0 02/17/89 N

SUBSYSTEM: ARS - COOLING
LRU LINES AND FITTINGS
ITEM NAME: LINES AND FITTINGS

CRITICALITY OF THIS FAILURE MODE: 1R2

FAILURE MODE:
EXTERNAL LEAKAGE

MISSION PHASE:
LO LIFT-OFF
OO ON-ORBIT
DO DE-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
: 103 DISCOVERY
: 104 ATLANTIS

CAUSE:
MECHANICAL SHOCK, VIBRATION, CORROSION, MATERIAL DEFECT

CRITICALITY 1/1 DURING INTACT ABORT ONLY? N

REDUNDANCY SCREEN A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF REDUNDANCY - LOSS OF ONE WATER COOLANT LOOP.

(B) INTERFACING SUBSYSTEM(S):
LOSS OF COOLING OF AFFECTED WATER COOLING LOOP. FREE WATER IN CABIN OR PAYLOAD BAY.

(C) MISSION:
POSSIBLE EARLY MISSION TERMINATION FOR LOSS OF ONE WATER COOLANT LOOP FOR CABIN AND AVIONICS COOLING.

(D) CREW, VEHICLE, AND ELEMENT(S):
POTENTIAL LOSS OF CREW/VEHICLE UPON SUBSEQUENT LOSS OF REDUNDANT WATE

3 PRINT DATE: 02/17/89

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-1B3-0571-01

COOLANT LOOP.

(E) FUNCTIONAL CRITICALITY EFFECTS

- DISPOSITION RATIONALE -

(A) DESIGN:
TUBES ARE MADE OF 3/16, 1/4, 3/8, 5/8 INCH O.D., 0.016 INCH WALL THICKNESS 21-6-9 CRES PER SPECIFICATION MB0160-035 CLASS 2. FITTINGS ARE MADE OF 17-4 PH AND 321 CRES AND BRAZED PER MA0107-311. THE PLUMBING IS ATTACHED TO SECONDARY STRUCTURE WITH METAL SADDLE CLAMPS BOLTED TO ALUMINUM LINE BLOCK. HIGH PURITY WATER, FLUID PRESSURE AND QUANTITY INSTRUMENTATION.

(B) TEST:
CERTIFICATION - FUNGUS, OZONE, SALINITY AND SAND AND DUST ARE CERTIFIED BY ANALYSIS PER MF0004-014. TEMPERATURE CERTIFICATION BY ANALYSIS FOR -10 F TO 120 F. PRESSURE BY ANALYSIS UP TO 360 PSIG. SHOCK AND VIBRATION BY ANALYSIS PER MF0004-014.

IN-VEHICLE TESTING - SYSTEM DECAY TEST IS PERFORMED USING GN2 AT 85 - 95 PSIG, 0.25 PSI/HR MAX LEAKAGE. PUMP OUT PRESSURE AND ACCUMULATOR QUANTITY ARE CONTINUOUSLY MONITORED WHEN THE VEHICLE IS POWERED UP AND SERVE AS AN INDICATION OF EXTERNAL LEAKAGE.

OMRSD - PUMP ACCUMULATOR QUANTITY AND OUTLET PRESSURE ARE CONTINUOUSLY MONITORED WHILE THE VEHICLE IS POWERED UP DURING EACH TURNAROUND AND SERVE AS AN INDICATION OF EXTERNAL LEAKAGE. WATER IS SAMPLED PER SPEC SE-S-0073 DURING SERVICING.

(C) INSPECTION:
RECEIVING INSPECTION
MATERIAL AND PROCESS CERTIFICATIONS VERIFIED BY INSPECTION.

CONTAMINATION CONTROL
CONTAMINATION AND CORROSION CONTROL REQUIREMENTS ARE VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION
INSTALLATION PER TUBING INSTALLATION SPECIFICATION VERIFIED BY INSPECTION. DIMENSIONS, TOLERANCES AND SURFACE FINISHES ARE VERIFIED. SEALING SURFACES ARE VERIFIED.

NONDESTRUCTIVE EVALUATION
LEAK TEST AND BRAZE JOINT RADIOGRAPHIC INSPECTIONS ARE VERIFIED BY INSPECTION.

4 PRINT DATE: 02/17

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-1B3-0571-01

CRITICAL PROCESSES
TUBE BRAZING IS VERIFIED BY INSPECTION.

TESTING
ATP IS VERIFIED BY INSPECTION.

HANDLING/PACKAGING
HANDLING AND PACKAGING REQUIREMENTS ARE VERIFIED BY INSPECTION.

(D) FAILURE HISTORY:
NO FAILURE HISTORY APPLICABLE TO EXTERNAL LEAKAGE FAILURE MODE. THE LINES AND FITTINGS HAVE SUCCESSFULLY PERFORMED WITHOUT FAILURE THROUGH THE DURATION OF THE SHUTTLE PROGRAM.

(E) OPERATIONAL USE:
TBS.

- APPROVALS -

RELIABILITY ENGINEERING: N. L. STEISSLINGER
DESIGN ENGINEERING : N. K. DUONG
QUALITY ENGINEERING : D. R. STOICA
NASA RELIABILITY :
NASA SUBSYSTEM MANAGER :
NASA QUALITY ASSURANCE :