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PRINT DATE: 11/07/81

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-1B1-0313-X

SUBSYSTEM NAME: ABS COOLING

REVISION: 11/07/88

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CLASSIFICATION	NAME	PART NUMBER
LRU	COUPLING, SLEEVE, FLEXIBLE	ME276-0024
LRU	DUCT	V070-613880

QUANTITY OF LIKE ITEMS: 3  
ONE DUCT  
TWO COUPLINGS

DESCRIPTION/FUNCTION:  
DUCT

ROUTES AIR FROM THE HUMIDITY CONTROL HEAT EXCHANGER TO THE WATER SEPARATORS.

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SHUTTLE CRITICAL ITEMS LIST - ORBITER

NUMBER: 06-1B1-0313-01

REVISION: 11/07/88

SUBSYSTEM: ARS COOLING  
LRU : COUPLING, SLEEVE, FLEXIBLE  
ITEM NAME: DUCT

CRITICALITY OF THIS  
FAILURE MODE: 2 2

FAILURE MODE:  
EXTERNAL LEAKAGE

MISSION PHASE:

LO           LIFT-OFF  
OO           ON-ORBIT

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

CAUSE:  
MECHANICAL SHOCK, VIBRATION, PHYSICAL DAMAGE

CRITICALITY 1/1 DURING ANY MISSION PHASE OR ABORT? N

REDUNDANCY SCHEM A) N/A  
                          B) N/A  
                          C) N/A

A)

B)

C)

- FAILURE EFFECTS -

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-1B1-0313-01

**(A) SUBSYSTEM:**

WATER ACCUMULATION AT HUMIDITY CONTROL HEAT EXCHANGER.

**(B) INTERFACING SUBSYSTEM(S):**

HIGH HUMIDITY; FREE WATER IN CABIN.

**(C) MISSION:**

POSSIBLE EARLY MISSION TERMINATION DUE TO FREE WATER IN CABIN.

**(D) CREW, VEHICLE, AND ELEMENT(S):**

NO EFFECT.

**RATIONALE FOR CRITICALITY:**

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 - DISPOSITION RATIONALE -  
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**(A) DESIGN:**

THE DUCT IS A ONE INCH O.D. 21-6-9 CRES TUBE, WALL THICKNESS 0.026 INCH. THE GAPS BETWEEN HUMIDITY SEPARATOR/DUCT AND THE HUMIDITY CONTROL HEAT EXCHANGER/DUCT ARE BRIDGED BY FLEXIBLE SILICONE/FIBERGLASS SLEEVES HELD IN PLACE BY BAND CLAMPS AND BEADS ON THE DUCT ENDS. SLEEVES ARE 2.75 INCHES LONG WITH 0.02 INCH WALL THICKNESS. A GROSS LEAKAGE OR A COMPLETELY DISLODGED DUCT MUST HAPPEN BEFORE LOSS OF CAPABILITY OF HUMIDITY REMOVAL OCCURS. THIS FAILURE IS CONSIDERED VERY REMOTE.

**(B) TEST:**

CERTIFICATION - TEMPERATURE CERTIFIED BY ANALYSIS FROM -10 F TO + 120 F. PRESSURE CERTIFIED BY ANALYSIS TO 30 PSIA. FUNGUS AND OZONE CERTIFIED BY ANALYSIS. THESE MATERIALS ARE NOT AFFECTED BY FUNGUS OR OZONE. SALINITY CERTIFIED BY ANALYSIS. THIS ENVIRONMENT DOES NOT AFFECT THE CHARACTERISTICS OF THESE MATERIALS. THE MATERIALS USED ARE APPROVED BY MATERIALS AND PROCESSES. RANDOM VIBRATION-CERTIFIED BY ANALYSIS TO THE FOLLOWING LEVEL: 20 TO 150 HZ, INCREASING AT 6 DB/OCTAVE; 150 TO 900 HZ, CONSTANT AT 0.09 G\*\*2/HZ; 1000 TO 2000 HZ, DECREASING AT 6 DB/OCTAVE, 48 MINUTES PER AXIS. DESIGN SHOCK CERTIFIED BY ANALYSIS TO A 20 G PEAK AMPLITUDE AND 11 MS DURATION SAWTOOTH PULSE APPLIED IN BOTH DIRECTIONS ON THREE AXES.

OMRSD - CABIN FAN DELTA-P IS MONITORED DURING EVERY TURNAROUND AND SERVES AS AN INDICATION OF SYSTEM PERFORMANCE/EXTERNAL LEAKAGE. FLEXIBLE AND HARD DUCTS ARE BEING COMPLETELY INSPECTED PRIOR TO FIRST REFLIGHT OF EACH ORBITER AND ARE ALSO INSPECTED AS AVAILABLE IN CONJUNCTION WITH REMOVAL OF PANELS/LRU'S. DUCTS ARE ALSO INSPECTED

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DURING PERIODIC ZONAL INSPECTIONS.

(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.

NONDESTRUCTIVE EVALUATION  
LEAK TEST IS VERIFIED BY INSPECTION.

CRITICAL PROCESSES  
CURING IS VERIFIED BY INSPECTION.


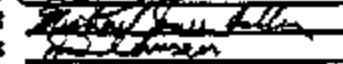
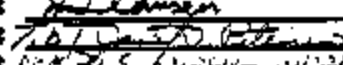
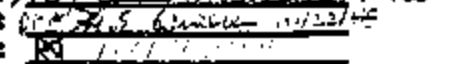
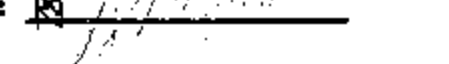
TESTING  
ATP IS VERIFIED BY INSPECTION.

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

(D) FAILURE HISTORY:  
NO FAILURE HISTORY APPLICABLE TO EXTERNAL LEAKAGE FAILURE MODE. THE DUCT HAS SUCCESSFULLY PERFORMED WITHOUT FAILURE THROUGH THE DURATION OF THE SHUTTLE PROGRAM.

(E) OPERATIONAL USE:  
TBS.

- APPROVALS -

RELIABILITY ENGINEERING:	N. L. STEISLINGER:	<i>NLS</i>	
DESIGN ENGINEERING	: N. K. DUONG	<i>kh</i>	
QUALITY ENGINEERING	: D. R. STOICA	<i>DRS</i>	
NASA RELIABILITY	:		 11/17/88
NASA DESIGN	:		 11/22/88
NASA QUALITY ASSURANCE	:		