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PRINT DATE: 11/07/

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-1B1-0342-I

SUBSYSTEM NAME: ABS COOLING

REVISION : 11/07/88

CLASSIFICATION	NAME	PART NUMBER
L&U :	CO2 ABS & TEMP CONTROL ASSY	MC621-0008-0412
SRU :	ORIFICE, METERING	SV767345-1

QUANTITY OF LIKE ITEMS: 1

DESCRIPTION/FUNCTION:
ORIFICE, METERING - CO2 ABSORBER

PROVIDES A RESTRICTION IN THE MAIN FLOW PATH SO THAT PART OF THE AIR
STREAM PASSES THROUGH THE LIQH CANISTER.

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SHUTTLE CRITICAL ITEMS LIST - ORBITER

NUMBER: 06-1B1-0342-01

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SUBSYSTEM: ARS COOLING
LRU : CO2 ARS & TEMP CONTROL ASSY
ITEM NAME: ORIFICE, METERING

CRITICALITY OF THIS
FAILURE MODE: LR2

FAILURE MODE:
RESTRICTED FLOW (CLOGGED)

MISSION PHASE:

LO LIFT-OFF
OO ON-ORBIT

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

CAUSE:
CONTAMINATION, MECHANICAL SHOCK

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

REDUNDANCY SCREEN A) PASS

B) PASS

C) PASS

A)

B)

C)

- FAILURE EFFECTS -

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-1B1-0342-01

(A) SUBSYSTEM:
REDUCED CABIN AIR FLOW.

(B) INTERFACING SUBSYSTEM(S):
INCREASED CABIN AIR TEMP, REDUCED FLIGHT DECK AVIONICS COOLING.

(C) MISSION:
POSSIBLE EARLY MISSION TERMINATION FOR SIGNIFICANT DECREASE OF AVIONICS COOLING.

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT.

RATIONALE FOR CRITICALITY:
FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO OVERHEATING AND MALFUNCTION OF FLIGHT DECK AVIONICS IF ADEQUATE COOLING CANNOT BE MAINTAINED. SECOND ASSOCIATED FAILURE (IN CABIN AIR LOOP) RESULTS IN FLIGHT DECK AVIONICS OVERHEATING AND MAY RESULT IN LOSS OF CREW/VEHICLE.

- DISPOSITION RATIONALE -

(A) DESIGN:
FAILURE MODE IS CONSIDERED TO BE REMOTE. UPSTREAM COMPONENTS ARE NOT CONTAMINATION GENERATORS. INLET AIR IS FILTERED BY THE CABIN FAN INLET DEBRIS SCREEN (40/70 MICRON) AND UPSTREAM AVIONICS BOX INLET FILTERS (50 X 250 MESH). THE ORIFICE IS A FLAT STAINLESS STEEL PLATE (4.5 X 2. IN.) WHICH SLIDES UP AND DOWN TO BALANCE FLOW TO THE CO2 ELEMENTS.

(B) TEST:
ACCEPTANCE TEST - THERE IS NO SPECIFIC ATP FOR THE ORIFICE. OVERALL PERFORMANCE TEST OF THE CO2 ABSORBER AND TEMP CONTROLLER ASSEMBLY INCLUDES FLOW VS. DELTA-P TEST.

QUALIFICATION TEST - QUALIFIED WITH THE CO2 ABSORBER AND TEMP CONTROLLER ASSEMBLY:
RANDOM VIBRATION SPECTRUM OF 20 TO 150 HZ INCREASING AT 6 DB/OCTAVE TO 0.03 G**2/HZ, CONSTANT AT 0.03 G**2/HZ FROM 150 TO 1000 HZ, DECREASING AT 6 DB/OCTAVE FROM 1000 TO 2000 HZ FOR 48 MINUTES PER AXIS IN THREE ORTHOGONAL AXES. DESIGN SHOCK - THREE TERMINAL SAWTOOTH PULSES OF 20 G PEAK AMPLITUDE AND 11 MS DURATION APPLIED IN BOTH DIRECTIONS ALONG EACH OF THREE ORTHOGONAL AXES. ATP PERFORMED TO VERIFY LEAKAGE AFTER SHOCK AND VIBRATION TESTING.

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IN-VEHICLE TESTING - CABIN FAN DELTA-P IS MONITORED CONTINUOUSLY WHEN THE VEHICLE IS POWERED UP AND SERVES AS AN INDICATION OF BLOCKAGE.

OMRSD - CABIN FAN DELTA-P IS MONITORED CONTINUOUSLY WHEN THE VEHICLE IS POWERED UP AND WILL DETECT RESTRICTED FLOW OF ORIFICE. CABIN FAN PERFORMANCE IS VERIFIED IN FLIGHT AND EVERY TURNAROUND.

(C) INSPECTION:

RECEIVING INSPECTION

INCOMING PARTS ARE VERIFIED FOR MATERIAL AND PROCESS CERTIFICATION.

CONTAMINATION CONTROL

PRODUCT CLEANLINESS IS MAINTAINED TO LEVEL 300 PER REQUIREMENT. EXTERNAL AND INTERNAL SURFACE CLEANLINESS IS VERIFIED PER H.S. REQUIREMENTS. CORROSION PROTECTION PROVISION IS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

PRODUCTS ARE VISUALLY EXAMINED BEFORE ACCEPTANCE TEST. INSPECTION VERIFIES ABSENCE OF DEBRIS AND CLOGGING.

NONDESTRUCTIVE EVALUATION

LEAK TEST IS VERIFIED BY INSPECTION.

TESTING

ATP IS VERIFIED BY INSPECTION.

HANDLING/PACKAGING

PACKAGING FOR SHIPMENT IS VERIFIED BY INSPECTION.

(D) FAILURE HISTORY:

NO FAILURE HISTORY APPLICABLE TO RESTRICTED FLOW FAILURE MODE. THE ORIFICE HAS SUCCESSFULLY PERFORMED WITHOUT FAILURE THROUGH THE DURATION OF THE SHUTTLE PROGRAM.

(E) OPERATIONAL USE:

YES.

- APPROVALS -

RELIABILITY ENGINEERING:	N. L. STEISSLINGER	<i>[Signature]</i>
DESIGN ENGINEERING	: N. K. DUONG	<i>[Signature]</i>
QUALITY ENGINEERING	: D. R. STOICA	<i>[Signature]</i>
NASA RELIABILITY	:	<i>[Signature]</i>
NASA DESIGN	:	<i>[Signature]</i>

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