

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE

NUMBER: 06-3D-0507 -X

SUBSYSTEM NAME: ATCS - RADIATORS AND FLOW CONTROL

REVISION: 0

12/05/97

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: TRICKLE FLOW ORIFICE	V070-613185-007
	BOEING	V070-613185-007

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
TRICKLE FLOW ORIFICE (ORIFICE#2)

REFERENCE DESIGNATORS:

QUANTITY OF LIKE ITEMS: 2
ONE PER EACH COOLING LOOP

FUNCTION:
PROVIDES SUFFICIENT PRESSURE DROP TO CRACK THE CHECK VALVE THUS
ALLOWING TRICKLE FLOW.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 06-3D-0507-01

REVISION#: 0 11/24/97

SUBSYSTEM NAME: ATCS - RADIATORS AND FLOW CONTROL

LRU: TRICKLE FLOW ORIFICE

CRITICALITY OF THIS
FAILURE MODE: 1R2

ITEM NAME: TRICKLE FLOW ORIFICE

FAILURE MODE:
EXTERNAL LEAKMISSION PHASE: OO ON-ORBIT
DO DE-ORBITVEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
103 DISCOVERY
104 ATLANTIS
105 ENDEAVOURCAUSE:
VIBRATION, MECHANICAL SHOCK, CORROSION, CONTAMINATION.

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

LEAK AT TRICKLE FLOW ORIFICE WILL CAUSE LOSS OF ONE FREON COOLANT LOOP AND PROBABLE LOSS OF MISSION.

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(B) INTERFACING SUBSYSTEM(S):

AFTER FIRST FAILURE POSSIBLE SHUTDOWN OF EFFECTED SYSTEMS DUE TO REDUCED COOLING CAPACITY.

(C) MISSION:

PROBABLE LOSS OF MISSION FIRST FAILURE:

- (1) EXTERNAL LEAK TRICKLE FLOW ORIFICE.

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

PROBABLE LOSS OF MISSION AFTER FIRST FAILURE:

- (1) EXTERNAL LEAK TRICKLE FLOW ORIFICE

POSSIBLE LOSS OF CREW/VEHICLE AFTER TWO FAILURES:

- (1) EXTERNAL LEAK TRICKLE FLOW ORIFICE
- (2) LOSS OF REDUNDANT COOLING LOOP.

(E) FUNCTIONAL CRITICALITY EFFECTS:

PROBABLE LOSS OF MISSION AFTER ONE FAILURE:

- (1) EXTERNAL LEAK, TRICKLE FLOW ORIFICE CAUSES LOSS OF COOLANT FROM EFFECTED COOLANT LOOP WITH RESULTANT LOSS OF COOLANT LOOP.

POSSIBLE LOSS OF CREW/VEHICLE AFTER ONE ADDITIONAL FAILURE:

- (1) LOSS OF REDUNDANT COOLANT LOOP CAUSES LOSS OF ALL VEHICLE COOLING.

-DISPOSITION RATIONALE-

(A) DESIGN:

THE ORIFICE IS SIZED TO 0.455" TO OVERCOME CHECK VALVE CRACKING PRESSURE AND COMBINED PRESSURE DROPS OF CHECK AND ISOLATION VALVES. THE ORIFICE DELTA PRESSURE IS NOT ADDITIVE TO VALVES' DELTA PRESSURE. THE COOLANT WILL FLOW THROUGH THE ORIFICE IN BOTH DIRECTIONS THUS PERMITTING SELF CLEANING.

(B) TEST:

GROUND TURNAROUND TEST

FREON COOLANT LOOPS ARE LEAK CHECKED PRIOR TO EACH FLIGHT.

(C) INSPECTION:

NONE.

(D) FAILURE HISTORY:

NO APPLICABLE FAILURE HISTORY.

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(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.

- APPROVALS -

SS & PAE MANAGER
SS & PAE ENGINEER
ECLSS-ATCS
BNA SSM
JSC MOD
JSC RDE

USA/Orshiter

Fa: D.F. MIKULA
: K.E. RYAN
: L. T. HARPER
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