SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ACTIVE THERMAL CONTROL FMEA NO 06-3C -0212 -2 REV:08/23/8

ASSEMBLY :FREON THERMAL LOOP
P/N RI :MC276-0020-1233
P/N VENDOR:
QUANTITY :2
:TWO,ONE PER LOOP
:

CRIT. FUNC: 1R
CRIT. HDW: 2

VEHICLE EFFECTIVITY:	102 X	103 X	104 X
PHASE(S):	PL LO X OO X DO X LS		

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS

PREPARED BY:		APPROVED BY:	APPROVED BY (NASA):
DES	O. TRAN	DES	SSM
REL	D. RISING	REL	REL
QE	W. SMITH	QE	QE

ITEM:
QUICK DISCONNECT/CAP, FREON SERVICING.

FUNCTION:
PROVIDES QUICK SELF SEALING CONNECTION FOR GROUND SERVICING AND SAMPLING. A PRESSURE CAP IS INSTALLED AFTER SERVICING.

FAILURE MODE:
EXTERNAL LEAKAGE.

CAUSE(S):
VIBRATION, MECHANICAL SHOCK, POROSITY, CORROSION.

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE

(A,B) POSSIBLE LOSS OF ONE FREON COOLANT LOOP FOR VEHICLE COOLING.

(C) POSSIBLE LOSS OF MISSION. EARLY MISSION TERMINATION FOR FIRST FAILURE

(D) SECOND ASSOCIATED FAILURE (LOSS OF REDUNDANT FREON COOLANT LOOP) WILL CAUSE LOSS OF ALL VEHICLE COOLING AND MAY RESULT IN LOSS OF CREW/VEHICLE.

DISPOSITION & RATIONALE:
(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A) DESIGN
ALL STAINLESS STEEL CONSTRUCTION WITH AN ETHYLENE PROPYLENE (EPR) O-RING SEAL AND A TEFLON BACKUP RING SEAL. CAP IS STAINLESS STEEL WITH EPR O-RING SEAL. POPPET IS SPRING LOADED CLOSED. CAP IS INSTALLED PREFLIGHT WHICH PROVIDES A BACKUP SEAL FOR POPPET. MATERIALS ARE CORROSION RESISTANT AND COMPATIBLE WITH FREON 21.

(B) TEST
QUALIFICATION TEST - QUALIFICATION TESTED FOR 100 MISSION LIFE. VIBRATION TESTED AT 0.7 G^2/HZ FOR 48 MIN/AXIS, SHOCK TESTED AT +/- 20 G EACH AXIS. DESIGN PROOF IS 480 PSIG AND UNIT DID NOT RUPTURE OR LEAK AT MAX TEST PRESSURE OF 1280 PSIG.

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ACCEPTANCE TEST - SPECIAL TOOLING IS USED IN ATP TO LEAK TEST PRESSURE CAP WHEN CONNECTED TO MAXIMUM AND MINIMUM SIZED CONNECTORS TO ASSURE PROPER FIT TO ALL QD'S. QD IS ACCEPTANCE LEAK TESTED WITH HELIUM.

OMRSD - LEAK CHECK OF QD AFTER GSE DEMATING AND PRIOR TO CAP INSTALLATION. VISUAL INSPECTION OF CAP, INCLUDING O-RING SEAL, PRIOR TO INSTALLATION. FREON CHEMICAL ANALYSIS PER SE-S-0073 DURING SERVICING.

(C) INSPECTION

RECEIVING INSPECTION
RAW MATERIAL AND PROCESS CERTIFICATIONS ARE VERIFIED BY INSPECTION. VISUAL INSPECTION/ID PERFORMED. PARTS PROTECTION IS VERIFIED BY INSPECTION.

CONTAMINATION CONTROL
SYSTEM FLUID SAMPLE PERIODICALLY ANALYZED FOR CONTAMINATION AND VERIFIE BY INSPECTION. CORROSION PROTECTION PROVISIONS ARE VERIFIED BY INSPECTION. CLEANLINESS TO LEVEL 100A PER MA0110-301 IS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION
MANUFACTURING, INSTALLATION AND ASSEMBLY OPERATIONS ARE VERIFIED BY INSPECTION ON SHOP TRAVELER MIPS. PROCESSING EQUIPMENT CONTROLS ARE VERIFIED BY INSPECTION.

CRITICAL PROCESSES
HEAT TREATMENT, INCLUDING ROCKWELL HARDNESS TEST, IS VERIFIED BY INSPECTION. ANODIZING AND PASSIVATION ARE VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION
LEAK TEST IS VERIFIED BY INSPECTION.

TESTING
VISUALLY INSPECT FOR DAMAGE AND EXTERNAL LEAKAGE. INSPECTION MONITORS TEST TO VERIFY FUNCTIONAL OPERATION IS WITHIN SPECIFIED LIMITS.

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

(D) FAILURE HISTORY
NO FAILURE HISTORY.

(E) OPERATIONAL USE
ON-BOARD ALARM, FREON FLOW, WILL INDICATE HARDWARE FAILURE. FREON PUMP WILL BE TURNED OFF AND LOSS OF ONE FREON LOOP POWERDOWN WILL BE PERFORMED. ENTRY AT NEXT PRIMARY LANDING SITE.