

AUG 11 1988

Critical Item: Expansion Valve

Find Number: A108019

Criticality Category: 15

SAA No: 09GS05-003

System/Area: ECS/SLF/SLS

NASA

PMN/ S70-0534/

Part No: N/A

Name: Portable Purge Unit

Mfg/ Dunham Bush/ALCO Controls

Drawing/

Part No: LCLE6B

Sheet No: 79K06061/1

Function: Senses temperature of return seal oil and injects liquid/gaseous R-12 to cool compressor.

Critical Failure Mode: Fails closed or clogs. FM No. 09GS05-003.017

Failure Cause: ^{due to} Contamination, structural failure.

Failure Effect: Loss of ability to cool compressor. Compressor overheats and shuts down. Blower/compressor interlock shuts down blower. Loss of air flow results in loss of purge to Orbiter compartments. Loss of ability to monitor purge air for leaks. Possible loss of life or vehicle during a hazardous condition such as leakage of hazardous fluids or gases.

Acceptance Rationale

Design:

- o The expansion valves used in this system are within the manufacturer's design constraint for use with refrigerant-12 coolant. Design pressure - 300 psig; operated - 160 psig max.
- o Unit operating media is R-12 and a closed system. Also, a filter/dryer unit is provided to prevent moisture and contaminants from entering the expansion valve.

Expansion Valve A108019 (Continued)

Test:

- o The OMRSD, File VI will require that operation of the purge unit is verified prior to each use.
- o The purge unit is powered up and verified operational approximately three hours prior to Orbiter landing per OMI 50028 and 50026.

Inspection:

- o There is no inspection available for the expansion valve that would not require the refrigerant system to be open to the atmosphere.

Failure History:

- o PRACA failure history indicates that five problem reports were written against this Component in the Critical failure mode.
 - Valve will not adjust, fails closed. Replaced valve.
 - Kink in capillary tube, valve failed closed. Repaired tube.
 - Capillary tube is broken, valve fails closed. Replaced tube.
 - Capillary tube is broken, valve fails closed. Replaced tube.
 - Powerhead on valve was bad, replaced powerhead.
- o No GIDEP failure history identified.

Operational Use:

- o There is nothing that can be done immediately to mitigate the effect of the failure.
- o The purge unit is monitored for any indication of malfunction. If any anomalies are observed, appropriate steps are taken to repair or replace the item.