

**SSMF IEA/CIL
REDUNDANCY SCREEN**

Component Group: Orifices
CIL Item: N707-01
Part Number: RS007159
Component: Main Injector Oxidizer Purge Orifice (N7)
FMEA Item: N707
Failure Mode: Orifice restricted or blocked.

Prepared: D. Early
Approved: T. Nguyen
Approval Date: 7/25/00
Change #: 1
Directive #: CCBD ME3-01-5638

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Phase	Failure / Effect Description	Criticality Hazard Reference
PS 4.1	HPV warmant flow is inactive, cold soaking of component causes internal leakage. Leakage will not affect HPV operation. Loss of flow through this orifice reduces the purge flow below acceptable limits for inerting propellant leakage at ICD limits. Potential open air fire. Reduced or loss of flow to main chamber oxidizer dome causes moisture not to be cleared from dome. Ice formed during start. LOX orifices partially blocked causing combustion within the post, post burn- through and extensive erosion. Loss of vehicle.	1 ME-A1P, ME-B4S

Redundancy Screens: SINGLE POINT FAILURE: N/A

SSME FMEA/CIL
DESIGN

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Design / Document Reference

FAILURE CAUSE: A: Contamination.

A GASEOUS NITROGEN (GN2) PURGE IS USED DURING PROPELLANT CONDITIONING TO REMOVE MOISTURE AND TO DILUTE PROPELLANT LEAKAGE. GASEOUS NITROGEN PARTICULATES ARE CONTROLLED BY THE INTERFACE CONTROL DOCUMENT (1). CLEANLINESS REQUIREMENTS ARE ESTABLISHED TO REDUCE THE POSSIBILITY OF ORIFICE BLOCKAGE (2). ENGINE SYSTEMS ARE CLEANED TO APPLICABLE MEDIA CLEANLINESS REQUIREMENTS (2). GN2 PURGE IS FILTERED BY THE PNEUMATIC CONTROL ASSEMBLY (PCA). THE GN2 INLET FILTER REMOVES PARTICULATES LARGER THAN 15-MICRON (3). THE PCA AND HELIUM PRECHARGE VALVE (HPV) DETAIL PARTS AND TEST FIXTURES ARE CLEANED (2) PRIOR TO ASSEMBLY (4). ASSEMBLY AND TEST ARE PERFORMED IN A CLEAN ROOM (5). LUBRICANTS ARE NOT ALLOWED FOR ASSEMBLY OR TEST (4). COMPONENT LEVEL TEST FLUIDS ARE NITROGEN AND HELIUM WHICH MEET THE HARDWARE CLEANLINESS REQUIREMENTS (2). THE COMPONENT PARTS AND SUBASSEMBLY ARE FREE OF VISIBLE FOREIGN PARTICLES AT THE TIME OF ASSEMBLY (4). THE ORIFICE SIZE IS LARGER THAN ACCEPTABLE PARTICULATES.

(1) ICD13M15000; (2) RL10001; (3) R0019450; (4) RL00226, RL00347; (5) RQ0711-600

**SSME FA /CIL
INSPECTION AND TEST**

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Failure Causes	Significant Characteristics	Inspection(s) / Test(s)	Document Reference
A	FLANGE PCA GN2 INLET FILTER		RS007159 RES1090
	CLEANLINESS OF COMPONENTS	THE ASSEMBLY AND UPSTREAM COMPONENTS ARE CLEANED PER SPECIFICATION REQUIREMENTS.	RL10001
	PCA GN2 FILTER INTEGRITY	FILTERS ARE INSPECTED TO MEET FLOW AND FILTRATION REQUIREMENTS PER SPECIFICATION REQUIREMENTS.	RC1090
		ASSEMBLY INSTALLATION IS VERIFIED TO BE IN A CONTROLLED ENVIRONMENT.	RQ0711-600
		DURING THE PROPELLANT CONDITIONING THE OXIDIZER SYSTEM PURGE IS VERIFIED PER SPECIFICATION REQUIREMENTS.	OMRSD S00FB0.300

Failure History: Comprehensive failure history data is maintained in the Problem Reporting database (PRAMS/PRACA)
 Reference: NASA letter SA21/88/308 and Rocketdyne letter 88RC09761.

Operational Use: Not Applicable.