

**SSME FMEA/CIL
REDUNDANCY / SCREEN**

Component Group: Combustion Devices
 CIL Item: A600-03
 Part Number: RS009020
 Component: Fuel Preburner
 FMEA Item: A600
 Failure Mode: Blockage of one LOX ASI passage.

Prepared: A. Kay
 Approved: T. Nguyen
 Approval Date: 9/9/99
 Change #: 1
 Directive #: CCBD MF3-01-5238

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Phase	Failure / Effect Description	Criticality Hazard Reference
SMC 4.1	Blockage of one LOX ASI injection passage causes localized LOX-rich operation, erosion of the ASI combustion chamber walls, manifold invasion, injector burnout, and aft compartment overpressurization and fire. Loss of vehicle	1 ME-B2S ME-B2A,C, VE-B2M
	Redundancy Screens: SINGLE POINT FAILURE N/A	

SSME FMEA/CIL
DESIGN

Component Group: Combustion Devices
CIL Item: A600-23
Part Number: R5009020
Component: Fuel Preburner
FMEA Item: A600
Failure Mode: Blockage of one LDX ASI passage.

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Design / Document Reference

FAILURE CAUSE: A: Contamination of the ASI LDX injection passage.

THE SMALLEST PORTIONS OF THE ASI OXIDIZER PASSAGEWAY IS LARGER THAN THE ORIFICE INSTALLED APPROXIMATELY 5 INCHES UPSTREAM (1). ANY CONTAMINANT THAT COULD CAUSE PASSAGE BLOCKAGE WOULD HAVE TO COME FROM THIS SHORT LENGTH OF LINE. HOT FIRE TESTING OF THE ENGINE WILL REVEAL BLOCKAGE PROBLEMS PRIOR TO FLIGHT USE (2) THE ASI ORIFICE IS ASSEMBLED IN A CONTAMINATION CONTROLLED ENVIRONMENT (3)

(1) R5009020, R5009019 (2) RLC0050-04; (3) RQC711-600

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**SSME FW/ JIL
INSPECTION AND TEST**

Component Group: Combustion Devices
 CIL Item: A600-03
 Part Number: RS009020
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Failure Causes	Significant Characteristics	Inspection(s) / Test(s)	Document Reference
A	ASI ASSEMBLY HOT-GAS MANIFOLD		RS009020 RS007051
	ASI SYSTEM CLEANLINESS	ASI SUBASSEMBLIES AND THE MOV ARE CLEANED DURING MANUFACTURING TO OXYGEN SERVICE REQUIREMENTS. AFTER BRAZING, THE PASSAGE PORTS AND CRIFICES ARE INSPECTED FOR BLOCKAGE DUE TO BRAZING MATERIAL. DURING THE PROPELLANT CONDITIONING, THE OXIDIZER ASI SYSTEM IS PURGED TO MAINTAIN IT FREE OF MOISTURE AND ICE.	RL1000i RA1610-035 RA1607-017 RA1607-018 OMRSD 0001 B3 300
	PROPELLANT SYSTEM CLEANLINESS	SSME PROPELLANT SYSTEM IS DRIED AND VERIFIED DRY PRIOR TO EACH FLIGHT.	OMRSD V41060 080 OMRSD V41060 081
	ASSEMBLY INTEGRITY	THE HOT FIRE TESTING AND 2ND E & M INSPECTIONS VERIFY ASI INTEGRITY. THE ASI CHAMBER IS INSPECTED FOR DAMAGE PRIOR TO EACH LAUNCH. (LAST TEST)	RL00055-04 RL00055-06 RL00055-07 OMRSD V41010 040

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Failure History: Comprehensive failure history data is maintained in the Problem Reporting database (PRAMS/PRACA).
 Reference: NASA letter SA2188/308 and Rocketdyne letter 88RC09761
 Operational Use: Not Applicable

**SSME F A/CIL
WELD JOINTS**

Component Group: Combustion Devices
 CIL Item: A600
 Component: RS009020
 Part Number: Fuel Preburner
 A600

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Component	Basic Part Number	Weld Number	Weld Type	Class	Access	Critical Initial Flaw Size Not Detectable		Comments
						Root Side Not	HCF LCF	
FPB CHAMBER	RS009019	1,2	GTAW	I	X	X	X	
FPB INJECTOR	RS009020	1	EBW	II	X	X	X	
FPB INJECTOR	RS009020	2	EBW	II	X			
FPB INJECTOR	RS009020	3	GTAW	I	X	X	X	
FPB INJECTOR	RS009020	9	EBW	II	X			
FPB INJECTOR	RS009020	38	EBW	II	X			
FPB INJECTOR	RS009020	39	EBW	II	X			
FPB BODY	RS009023	1 (OPT)	GTAW	I	X			(AC50)
FPB BODY	RS009023	5	EBW	I	X			(AC50)
FPB FUEL MANIFOLD	RS009029	7 (OPT), 8 (OPT)	GTAW	I		X	X	(AC50)
FPB FUEL MANIFOLD	RS009029	11 (OPT)	GTAW	I		X		(AC50)
FPB FUEL MANIFOLD	RS009029	13 (OPT)	GTAW	I		X		(AC50)
FPB OXID INLET	RS009030	1	GTAW	I		X		
FPB OXID INLET	RS009030	2	GTAW	I	X	X	X	
FPB OXID INLET	RS009030	4	GTAW	I				
PREBURNER EXPANSION JOINT	RS009032	1	GTAW	I				
PREBURNER EXPANSION JOINT	RS009032	2,3	GTAW	II	X			
FPB ASH FUEL LINE	RS009026	1 PLC	GTAW	I	X			
FPB CHAMBER	RS009019	3 (OPT), 4 (OPT)	GTAW	I		X	X	(AC50)
FPB CHAMBER	RS009019	5 (OPT)	GTAW	I		X		(AC50)
FPB CHAMBER	RS009019	6 (OPT)	GTAW	I		X		(AC50)

**SSME FMEA/CIL
FIELD CONFIGURATION VARIANCES FROM CIL RATIONALE**

Component Group: Combustion Devices
 Item Name: Fuel Preburner
 Item Number: A603
 Part Number: RS009920

Prepared: A. Kay
 Approved: T. Nguyen
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Base Line Rationale	Variance	Change Rationale	Variant Dash Number
1. A603- NO RATIONALE EFFECTED.	MDLY LINER IS INSTALLED IN VARIOUS PREBURNER ASSEMBLIES.	LINER MAY BECOME DAMAGED. USE AS IS RATIONALE; DEBONDED LINER HAS BEEN DETERMINED TO BE A CRITICALITY THREE.	RS007051-1441 RS007051-1457

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