

**SSME FMEA/CIL
REDUNDANCY SCREEN**

Component Group: Propellant Valves
 CIL Item: D150-03
 Component: Chamber Coolant Valve
 Part Number: RS008259
 Failure Mode: Structural failure.

Prepared: P. Lowrimore
 Approved: T. Nguyen
 Approval Date: 6/30/99
 Change #: 1
 Directive #: CCBD ME3-01-5228
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Phase	Failure / Effect Description	Criticality Hazard Reference
SMC 4.1	Fuel flow to preburners reduced; high pressure fuel leakage into aft compartment. Loss of vehicle. Redundancy Screens: SINGLE POINT FAILURE; N/A	1 ME-03S,A M,C

SSME / A/CIL
DESIGN

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Design / Document Reference

FAILURE CAUSE: A: Fracture of CCV cartridge.

THE CCV CARTRIDGE (1) IS MADE FROM HEAT TREATED A-286 BAR. A-286 WAS SELECTED FOR ITS DUCTILITY, ELASTIC MODULUS, CRYOGENIC PROPERTIES, AND RESISTANCE TO HEE (2). THE HIGH CYCLE AND LOW CYCLE FATIGUE LIFE OF THE CCV MEETS CEI REQUIREMENTS (3). THE MINIMUM FACTORS OF SAFETY FOR THE CCV MEET CEI REQUIREMENTS (4). THE CCV WAS CLEARED FOR FRACTURE MECHANICS/IDE FLAW GROWTH, SINCE IT CONTAINS NO FRACTURE CRITICAL PARTS (5). THE CCV HAS COMPLETED DESIGN VERIFICATION TESTING (6), INCLUDING VIBRATION (7), AND ENDURANCE TESTS (8).

(1) RS008177; (2) RSS-8582; (3) RL00532, CP320R0003B; (4) RSS-8546 CP320R0003B; (5) NASA TASK 117; (6) DVS-SSME-515; (7) RSS-515-24; (8) RSS-515-17

**SSME FMEA/CIL
INSPECTION AND TEST**

Component Group: Propellant Valves
 CIL Item: D150-03
 Component: Chamber Coolant Valve
 Part Number: RS008269
 Failure Mode: Structural failure.

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Failure Causes	Significant Characteristics	Inspection(s) / Test(s)	Document Reference
A	CARTRIDGE ASSEMBLY		RS008177
	MATERIAL INTEGRITY	MATERIAL INTEGRITY IS VERIFIED PER DRAWING REQUIREMENTS. HEAT TREAT IS VERIFIED PER DRAWING REQUIREMENTS.	
	ASSEMBLY INTEGRITY	ASSEMBLY AND PROOF PRESSURE TEST VERIFIES INTEGRITY OF CCV CARTRIDGE.	RL00155
	FLIGHT FLOW TESTING	THE VALVE IS HELIUM SIGNATURE LEAK TESTED AND VALVE OPERATION IS VERIFIED DURING PRE-LAUNCH CHECKOUTS. (LAST TEST)	OMRSD S00000.950 OMRSD V41AS0.030 OMRSD S00FA0.211

Failure History: Comprehensive failure history data is maintained in the Problem Reporting database (PRAMS/PRACA)

Reference: NASA letter SA21/88/308 and Rocketdyne letter 88RC09781.

Operational Use: Not Applicable.

SSME / FA/CIL
WELD JOINTS

Component Group: Propellant Valves
 CIL Item: D150
 Component: Chamber Coolant Valve
 Part Number: RS008259

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Component	Basic Part Number	Weld Number	Weld Type	Class	Root Side Not Access	Critical Initial Flaw Size Not Detectable		Comments
						HCF	LCF	
SHAFT	RS008162	3	GTAW	II	X	X		