

CRITICAL ITEMS LIST (CIL)

SYSTEM: Propulsion/Mechanical  
 SUBSYSTEM: LH2 Propellant Feed  
 REV & DATE: J, 12-19-97  
 DCN & DATE: 002, 2-28-99  
 ANALYSTS: J. Attar/H. Claybrook

FUNCTIONAL CRIT: 1  
 PHASE(S): a, b  
 HAZARD REF: P.06, P.07

FAILURE MODE: Failure to Meet LH2 Cleanliness Specification  
 FAILURE EFFECT: a) Loss of mission and vehicle/crew due to fire/explosion resulting from debris damaging turbo pump.  
 b) Loss of mission and vehicle/crew due to fire/explosion resulting from debris damaging turbo pump.  
 TIME TO EFFECT: Seconds  
 FAILURE CAUSE(S): Contaminated LH2 Feedline  
 REDUNDANCY SCREENS: Not Applicable  
 FUNCTIONAL DESCRIPTION: Receives LH2 from Orbiter during tanking and provides LH2 to Orbiter for drain, recirculation and engine demand.

FMEA ITEM CODE(S)	PART NO.	PART NAME	QTY	EFFECTIVITY
2.5.10.1	80924901916-009	LH2 Internal Feed Instl	1	LWT-54 & Up
2.5.11.1	80914961960-009	Tank Fitting Instl	1	LWT-54 thru 88
	-500		1	LWT-89 thru 599
	-010		1	LWT-600 & Up
2.5.12.1	80921011009-010	LH2 External Feedline	1	LWT-54 thru 88
	-509		1	LWT-89 & Up
2.5.13.1	80921011009-019	LH2 GFP Disconnect Instl	1	LWT-54 thru 88
	-510		1	LWT-89 & Up

REMARKS: These items are grouped as their failure mode, causes, and effects are the same.

CRITICAL ITEMS LIST (CIL)  
CONTINUATION SHEET

SYSTEM: Propulsion/Mechanical  
SUBSYSTEM: LH2 Propellant Feed  
FMEA ITEM CODE(S): 2.5.10.1, 2.5.11.1, 2.5.12.1, 2.5.13.1

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RATIONALE FOR RETENTION

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DESIGN:

The LH2 feed system consists of the tank fitting and four line components including two flexible assemblies, a siphon line section, and the ET/ORB disconnect assembly. A Naflex seal is provided between the external feedline and ET/ORB disconnect mating flanges. Bellows sections provided on each flexible feedline accommodate installation tolerances, temperature induced shrinkage and flight motions. The feedlines provide for the transfer of LH2 to the tank during propellant loading and transfer of LH2 from the tank to the Orbiter during engine operation. Propellant quality supplied to the Orbiter from the tank is controlled through the use of a 400 micron screen.

Cleanliness of the LH2 tank fitting, feedline assemblies, and Naflex seal downstream of the propellant screen is specified for hydrogen service. Maintaining cleanliness is specified for vehicle assembly and for vehicle processing at the launch site.

TEST:

Installation drawings listed as part numbers for these item codes are certified for cleanliness failure modes by HCS MMC-ET-TM08-L-P017. The Tank Fitting Installation, item code 2.5.11.1 for LWT-89 & Up, is certified by HCS MMC-ET-TM08-L-S503. Part numbers for the components to be inspected for cleanliness in each installation drawing are listed below.

2.5.10.1 LH2 Internal Feed Installation  
\* PD4800177-010  
80924901909-009,-500

2.5.11.1 Tank Fitting Installation  
80914961960-009,-500, -010

2.5.12.1 LH2 External Feedline  
\*\* PD4800184-020,-029,-039

2.5.13.1 LH2 GFP Disconnect Installation  
V527-415267  
ME261-0045

Acceptance:

Vendor:

Perform particulate tests (STP5008).

MAE:

Perform particulate tests on applicable subsystem element (STP5008 and 5009).

