

**Critical Items List (CIL) Sheet**

**Critical Item:** Disconnect, Quick, Female, ¼ In.   **B/L:** 810.30  
**Total Quantity:** 3 items                                   **SYS:** ECLSS  
**Find Number:** 1D2, 2D2, 3D3  
**Criticality Category:** 1S

**FMEA/CIL No:** SSD99FO002                                   **System/Area:** ECLSS / SLS, SLF, OPF

**NASA Part No:** MC276-0020-2022                                   **PMN/ Name:** S70-0985-01,-02 / ECLSS, GN2 Purge

**Mfg/ Part No:** Symetrics / 502040-2022                                   **Drawing/ Sheet No:** G070-683286/1

**Function:**

Provides quick connect / disconnect of GN2 fluid path between the Orbiter Waste Collection System Vacuum Vent Duct and the Orbiter Water Tank GN2 Supply System.

**Critical Failure Mode/Failure Mode No:**

Separate Prematurely / FMN: SSD99FO002.001

**Failure Cause:**

Worn / broken latching locks or springs.

**Failure Effect:**

Loss of GN2 purge. GH2 accumulation in Orbiter vacuum vent duct. Possible ignition of accumulated GH2. Possible loss of life / vehicle during a hazardous condition (ref. SSP Hazard: ORBI 240). This failure is visually detectable.

Time to effect: Minutes

## ACCEPTANCE RATIONALE

### Design:

This ¼ inch female coupling is a mechanical connector which permit separation of a fluid system line without fluid loss. Both the male and female halves have integral poppet valves which stop flow when the halves are separated.

		<u>Rated:</u>	<u>Actual:</u>
- Temperature:	- Fluid media:	120° F	50-80° F
	- Ambient:	160° F	70-90° F
- Pressure:	- System Operating	35 psig	18 psig
	- Proof	83 psig	-
	- Burst	110 psig	-
- Fluid Media:		Water/GN2	GN2
- Material	- Body:	15-5 Stainless Steel (Precipitation Hardened)	
	- Sleeve Spring:	17-7 Stainless Steel (Precipitation Hardened)	
	- Wave Washer Spring:	17-7 Stainless Steel (Precipitation Hardened)	
	- Latching Locks:	15-5 Stainless Steel (Precipitation Hardened)	

### Test:

Prior to purchase, each quick disconnect was acceptance tested per the requirements of procurement specification MC276-0020. Applicable tests to this acceptance rationale are as follows:

- Proof Pressure Test: 83 psig
- Leakage Test: 0.33 sccm of GN2 over operating pressure / temperature range

Certification testing was performed on representative samples of the quick disconnect per the procurement specification MC276-0020. Applicable tests to this acceptance rationale are as follows:

- Burst Pressure Test: 110 psig
- Side Load Force Test: 200 in-lbs (50 lbs at 4 inches)
- Thermal Cycle Test: 3 cycles from minimum to maximum design temperature with leakage test performed at completion.

OMRSD File III, V64 AA0.090 requires test to verify flow.

**Inspection:**

Prior to installation, the quick disconnect is inspected for damage per the Shuttle Landing Procedure OMI S0026 (EAFB) or S0028 (KSC).

Prior to purchase, each quick disconnect was inspected per the requirements of Procurement Specification MC276-0020. Particular attention was given to weight, workmanship, finish, dimensions, construction, cleanliness, identification marking, traceability level, and to the use of certified materials and processes.

**Failure History:**

Current data on test failures, unexplained anomalies, and failures experienced during ground processing activities can be found in the PRACA database. The PRACA database was researched and no failure data were found on this component or other similar components in the critical failure modes.

The GIDEP failure data interchange system has been researched and no failure data were found on this component in the critical failure mode.

**Operational Use:**

Correcting Action: Re-attach disconnect.

Timeframe: Minutes