

DATE: June 20, 1988

FMEA #: 7B4-S70-0787-02,03-QD33 thru QD36-01

END ITEM EFFECTIVITY:

X X X  
OV102 OV103 OV104

MODEL NO/NAME: #S70-0787, PRSD/FCP QD/Filter Assy. Set

ORBITER SUBSYSTEM: PRSD/FCP Fluid System QTY: 6

PART NUMBER: PART NAME: REFERENCE DESIGNATION:

MC276-0010-4150 Disconnect QD33-34, 35-36  
-4250

CRITICALITY NUMBER: 2

FUNCTION: LO<sub>2</sub> and LH<sub>2</sub> interface from PRSD tanks to facility drain system.

CRITICAL FAILURE MODE: Leakage Before/After Separation

CAUSE: Mechanical/Thermal shock.

FAILURE EFFECT ON:

- (A) END ITEM: Fire could damage end item.
- (B) INTERFACING SUBSYSTEM(S): Fire could damage nearby GSE.
- (C) ORBITER: Leaking cryogenic fuel would damage thermal protection and present fire hazard.
- (D) PERSONNEL: Nearby personnel would be injured by fire.

HAZARDS: Leaking LO<sub>2</sub> or LH<sub>2</sub> would damage orbiter and create fire hazard that would injure personnel.

CORRECTIVE ACTION: Replace QD's/filter assembly.

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### ACCEPTANCE RATIONALE

**DESIGN:** The MC276-0010-4150 and -4250 are latching, Class 5 disconnects used with LO<sub>2</sub> and LH<sub>2</sub> systems respectively. The rated flow of the QD and filter is 10 GPM of LO<sub>2</sub> or 20 GPM of LH<sub>2</sub>. It will accept a reverse flow of 20,000 lb/hr of water without damage to filter element. Fluid temperature range for LO<sub>2</sub> is +115 to -297.5°F and for LH<sub>2</sub> +115 to -423°F. The factor of safety at proof pressure is 1.5.

**TEST:** Disconnects visually inspected for cleanliness and damage before use as specified in Preventative Maintenance OMI V6C90.

#### **INSPECTION:**

**RECEIVING INSPECTION:** Incoming materials are subjected to verification of material certification. Material inspection included both visual and dimensional examinations. Material certification and test records are maintained.

**CONTAMINATION CONTROL:** All internal parts and internal surfaces of the disconnect are cleaned to level 200A of MA0110-301 in an environment conforming to FED-STD-209, Class 100,000.

**ASSEMBLY/INSTALLATION:** Materials and processes used in fabrication of the disconnect are compatible with the environmental conditions specified in specification. Material, configuration, dimension, and finish are visually examined prior to installation. The poppet movement is checked for tolerance to preclude possible leakage. All parts are visually inspected for any evidence of mechanical deterioration.

**CRITICAL PROCESSES:** Heat treatment and parts passivation are verified by inspection.

**TESTING:** Disconnects are performance tested, including functional and environmental tests, as required by Specification Control Document before use in orbiter servicing.

**HANDLING/PACKAGING:** Handling, packaging, storage and shipment are verified by inspection.

**OPERATIONAL USE:** Operator will check to be sure that QD is firmly attached. Emergency procedures to contain leakage and extinguish fire are contained in OMI V1040, Vol. 3.

**FAILURE HISTORY:** PRACA database contains reports of occasional leakage. No damage to orbiter reported.

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END ITEM: #S70-0787, PRSD/FCP QUICK DISCONNECT/FILTER  
ASSEMBLY SET

PART NUMBER/REF. DESIGNATOR	PART NAME	QTY. (PER SYSTEM)	HDW. CRIT.
MC276-0010-4150 MC276-0010-4250 (QD33-34, 35-36)	Disconnect	6	2

The OMRSD, File VI, is in development and at the completion of this FMEA/CIL each critical item will be reviewed against it. If necessary, the OMRSD will be revised to cover all applicable requirements for each critical item.

TABLE 8 - 1  
CRITICAL ITEMS LIST