

DATE: October 16, 1990

FMEA #: 45-570-0505-08-FL*-01

SO40244P
ATTACHMENT -
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END ITEM EFFECTIVITY:

X	X	X
OV102	OV103	OV104

MODEL NO/NAME: 570-0505, Mid-Body Umbilical Carrier Plate

ORBITER SUBSYSTEM: Ground Support Equipment

PART NUMBER:	PART NAME:	REFERENCE DESIGNATION:	QUANTITY (PER SYSTEM)
NE286-0068-0001, -0003	Filter, In-line, Miniature	FL1, FL2	2

CRITICALITY NUMBER: 16

FUNCTION: Filter incoming GHe and GN₂ purge gases for routing to purge cans of carrier plate.

CRITICAL FAILURE MODE: Clog (loss of purge).

CAUSE: Contaminants in ground gas system

FAILURE EFFECT ON:

- (A) END ITEM: Possible damage to carrier plate components from fire/explosion or icing due to leaking LH₂ or LO₂.
- (B) INTERFACING SUBSYSTEM(S): Possible damage to ground fuel/oxidizer system (hoses, valves) from fire/explosion or icing due to leaking LH₂ or LO₂.
- (C) ORBITER: Loss of orbiter from fire/explosion of hydrogen, or damage to TPS from icing. Fire hazard creates danger of possible damage to orbiter PRSD system, including flight halves of QD's.
- (D) PERSONNEL: None.

HAZARDS: Cut-off of helium purge could lead to accumulation and possible ignition of hydrogen gas from fuel loading system; cutoff of nitrogen could lead to accumulation of oxygen resulting in fire hazard. Cutoff of either purge could result in icing.

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ACCEPTANCE RATIONALE

DESIGN: Filter is designed to be generally compatible with KC126 unions using Buna N and teflon seal rings. Filter element, once installed, is non-separable. Filter assembly is made of welded construction to minimize damage due to mechanical shock. No non-metals are used in the assembly (all parts are of 316L CRES). Filter element is single layer, non-sintered, non-calendared, Dutch weave wire mesh cloth which traps particles greater than 25-microns in size. Filter is rated up to 1500 psig, while operating pressure is 850 psig. Filter can function with a differential pressure of up to 400 PSI in either direction without collapse, ballooning, or losing filtering efficiency.

TESTS:

ACCEPTANCE TESTS: Acceptance tests per ME286-0068 include product examination, proof pressure, filter cleanliness, bubble point test and filter drying.

CHECK-OUT TEST: Check-out tests per ME286-0068 include clean pressure drop test, vibration, filtration and contamination capacity test, differential pressure test, lot acceptance test and reverse flow.

CERTIFICATION OR QUALIFICATION TESTS: The filters are in compliance with the source control drawing ME286-0068 and Mid-body Umbilical Carrier Plate document ML0308-0040. No certification or qualification tests were conducted on these filters.

INSPECTION: Filter case and element are precision cleaned to level 100A of MA0110-301, also passivated, vapor degreased, and sealed in contamination barrier bags and foam-cushioned for shipping. Filters are inspected for identification, damage or corrosion.

Welding is inspected for conformance to MIL-W-8811 or -6856 and ME286-0068 specification.

The filter is replaced with a new filter yearly or when delta pressure reaches 50 psia.

OPERATIONAL USE: Fluid line drain and purge to raise temperature and preclude leakage per V1040. Operations cannot continue safely without purge due to leakage tendency of LH₂.

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Cryogenic fluid leaks are detected by hazardous gas detection system. Terminate and purge the fuel supply line if leakage exceeds 3.5% per launch commit criteria.

FAILURE HISTORY: No carrier plate-related failures were reported against this part.