Critical Items List (CIL) Sheet

Critical Item: Check Valve **Quantity:** 2 per Carrier Plate

Find Number: 2620T-4TT-5

Criticality Category: 1S

FMEA/CIL No:	SSD01FO002	**System/Area:**	PAD (RSS 107' level)
NASA Part No:	2620T-4TT-5	**PMN/Name:**	S70-0767 APS Pod RH Servicing Carrier Plate
Mfg./Part No:	Circle Seal Controls, Inc.	**Drawing/Sheet No:**	GW70-580767 GO70-582810

Function: Prevent backflow of GN_2 and/or Hypergol vapor from the scupper cans to the RH APS/PBK Oxidizer Pressurization Purge & QD Actuation Panel.

Critical Failure Mode/Failure Mode No: Fails Closed/FMN: SSD01FO002.001

Failure Cause: Structural failure or corrosion.

Failure Effect: Possible fire resulting from uncontained MMH. Possible loss of life, personnel injury, and/or vehicle damage during a hazardous condition. Oxidizer leakage may lead to formation of Nitric Acid, which is corrosive to both equipment and personnel.

ACCEPTANCE RATIONALE

Design:

- Operating pressure: 0-3000 PSIG
- Actual pressure: 50 PSIG
- Body: Stainless steel 303
- Spring: Stainless steel 302
- O-Ring: Teflon
- Proof pressure: 4500 PSIG @ rated temperature range
- Burst pressure: 7500 PSIG @ rated temperature range
- Operating temperature: -100 degrees F to 400 degrees F
- Cracking pressure: 5 PSIG
- Leakage from zero to max operating pressure: zero
- Positive Sealing at any Differential Pressure

Test:

- OMI V1045VL1 requires validation of purge supply prior to ground-to-orbiter QD mating.
- OMRSD File VI requires validation of purge supply prior to QD mating.
- Acceptance tests: Circle Seal Acceptance Test Procedure T.M.1 Revision N requires proof pressure, reseat ability, leakage, cracking, and functional testing of all 2600 Series check valves prior to shipment.

Inspection:

- OMI V6A97 requires semi-annual inspection of the assembly to insure no damage, corrosion, or deterioration.
- OMRSD File VI requires semi-annual inspection of the assembly to insure no damage, corrosion, or deterioration.

Failure History:

- The PRACA database was queried and there were no failures in the critical mode for this component.

Operational Use:

- The Hypergol QDs are designed to be self-sealing when uncoupled.
- Coupling of QDs is done by personnel in Supplied Air Respirators (SAR), aprons, and gloves. During APS servicing, only authorized personnel in SCAPE suits are allowed in the area. Personnel in SCAPE suits perform demating.
- OMI V1045VL1 directs that purge functionality be verified prior to installation of Carrier Plate.
- OMI V1045VL1 directs the Orbiter Panel AP59-02 to be covered with an Orcofilm or Lectrolite protective barrier to shield the Orbiter from any contact with hypergols/vapors.
- Immediately after removal, the Carrier Plate is stored in the Purge Header. This prevents seal damage, maintains cleanliness, and stabilizes the unit from any damage from launch vibration.
- Hypergol leakage can be detected from the Hypergol Vapor Detection System that monitors the purge drain line.
- Correcting Action:

  There is no action that can be taken to mitigate the failure effect.
- Timeframe:

  Since no correcting action is available, timeframe does not apply.