Critical Item: Hydraulic Actuator (4 Items Total)

Find Number: A126408, A126409 (1 ea HB1 and HB2)

Criticality Category: 2

SAA No:	09FY093-007	**System/Area:**	Orbiter Main Access Platform HB1 and 2
NASA Part No:	None	**PMN/ Name:**	A70-0668 Orbiter Main Access Platform
Mfg/ Part No:	Parker Hannafin/Rotary Actuator Div. RDS74-18	**Drawing/ Sheet No:**	79K08118 EQ-9

Function: Raise and lower Platforms 11A-2, and 11A-5.

Critical Failure Mode/Failure Mode No: Internal leakage./09FY093-007.002

Failure Cause: Broken vane or worn components

Failure Effect: Platform free falls under its own weight down to the hard stops causing the hinges to fail allowing the platform to fall on the Orbiter. The failure would be visually detected and the time would be immediate.

ACCEPTANCE RATIONALE

Design:

Pressure	
Rated	**Actual**
1200 psi	975 - 1000 psi

Torque Each Actuator	
Rated	**Actual**
@1200 psi 48,000 in-lb	@1000 psi 40,000 in-lb

Degree of Rotation	
Rated	**Actual**
100°	90°

Attachment
S050234BJ
Sheet 11 of 21

Test:

- Actuator was tested by the manufacturer at twice the working pressure at the rated load with no seal failure.
- Per OMI V6C46 tests are performed every 5 years to calibrate the regulator valves that supply pressure to the actuator.
- OMRSD File VI requires verification of annual platform descent rate check.

Inspection:

- Per OMI V6C46 visual inspections are performed annually on each hydraulic platform to check for leaking hydraulic fluid.

Failure History:

- One problem report, PV6-133895, was written against actuator A126406 S/N M32154-3088 for actuator vane failure which caused the actuator to lose hydraulic pressure resulting in platform 17-3 free falling. An investigation of the actuator showed the brazing of the vane to the shaft broke due to the vane wearing against the cylinder wall. The cause was due to improper installation alignment, speed control setting and control valve operation causing the actuator shaft to flex resulting in the vane wearing against the cylinder wall. TPS A70-0668-00-001-165 corrected the alignment problems and a revision to the OMI corrected any operating discrepancies. No problems have occurred since this incident.
- The GIDEP failure data interchange system was researched and no failure data was found on this component in the critical failure mode.

Operational Use:

- Correcting Action:

  There is no action which can be taken to mitigate the failure effect.

- Timeframe:

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

Attachment
S050234 BJ
Sheet 12 of 21