SEP 0 2 1993

SAA09FT01-005

B/L: 323.60
SYS: CONDOR 170

Critical Item: COLUMN / BOOM EXTENSION CYLINDERS (2 Items)

Find Number: 26, 39

Criticality Category: 2

SAA No:	09FT01-005	**System/Area:**	CONDOR 170/LC39
NASA Part No:	NONE	**PMN/ Name:**	K60-1016 CONDOR 170
Mfg/ Part No:	CALAVAR/ 23044	**Drawing/ Sheet No:**	29030 1

Function: Each cylinder extends/retracts either the column or the boom.

Critical Failure Mode/Failure Mode No:

Piston Head Seal Failure (Column/Boom Cylinders) / 09FT01-005.003.

Failure Cause: Worn, Cut Seal

Failure Effect:

Column Cylinder: Hydraulic fluid and contaminates (seal debris) can bleed by the piston into the rod end. Subsequent operation of the column can circulate contaminates through holding valves compromising their integrity. The column can slowly retract until it reaches its fully retracted position or an obstruction is encountered.

Boom Cylinder (cylinder in tension): The cylinder will extend, at a rate proportional to the angle of the boom and the severity of the leak, until it reaches its fully extended position or an obstruction is encountered.

Failure is detectable by operator observation of uncommanded motion. Possible loss (damage) to a vehicle system if failure occurs in close proximity to flight hardware. Time to effect: seconds.

ACCEPTANCE RATIONALE

Design:

- The Hallite 58 piston head seal assembly consists of two "U" section rubberized fabric bases bonded to a rubber center, between two "L" shaped polyacetal bearing/anti-extrusion rings.
- The seal has a maximum working pressure of 10,000 psi in a -30° to +80°C temperature range. The system working pressure is 2500 psi.

Attachment
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- It is compatible with mineral based, water soluble, and water/glycol hydraulic fluids.

Test:

- Pre-operational set up verifies proper operation of CONDOR 170 components and all functions.
- OMRSD File VI verifies performance of an operational test annually. This assures proper operation of the CONDOR 170 systems, including boom/column cylinder seal integrity.

Inspection:

- No preventive maintenance inspection is available that would be applicable to the critical failure mode.

Failure History:

- Problem Report PV-6-185380 documents failures of both seals. The seals were replaced and continued to leak. Both cylinder barrels were examined and found to be out of tolerance, beyond the ability of the seals to seat. Both barrels have been replaced and the CONDOR returned to service.
- 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:

  Use of platform controls to reposition platform away from flight hardware if there is sufficient time/distance for the operator to react.

- Timeframe:

  Seconds.