Engineering Evaluation

Customer: FAA	Evaluation Date: 15 July, 2014	
Sales Order: 981753	Repair Order#: K166776	
Part Number: 2751550	Model Number:	
Serial Number: 0056	Complaint Verified: □Yes □No	

Reason for Return: Investigation

On July 5, 2013, about 1845 Pacific daylight time, a Rockwell International Corporation NA-265-65, Mexican registered XB-RSC, sustained substantial damage following a reported loss of control while taxiing at the McCarran International Airport (LAS) Las Vegas, Nevada. The airplane was registered to and operated by Eseasa Contrucciones, S. A. de C. V., under the provisions of Title 14 Code of Federal Regulations Part 91. The captain, first officer and four passengers were not injured. Visual meteorological conditions prevailed and instrument flight rules (IFR) flight plan was filed for the personal flight which originated from Brownsville, Texas at about 1755, central daylight time.

The pilots reported that prior to landing, the main hydraulic system lost pressure. The pilots selected the auxiliary hydraulic system and continued the approach. During the landing roll, about two thirds down the runway, the pilots turned onto a taxiway. Once on the taxiway, the captain reported he was unable to stop or steer the airplane as it proceeded across a parallel runway and then into a grass field and subsequently struck a metal beam located within a drainage area.

History:

Hyd Pump Repaired Nov 10, 2006: H107899

- Returned for Overhaul and had been previously repaired prior to 11/10/2006.
- Pump run-in test was out of specification: 2000rpm and 3000rpm shaft seal leakage leaks greater than 1drop/min.
- Spring, Coupling, Gasket & Cartridge Assy were replaced.

Time/Cycles: Unknown

Received Condition:

Unit received is very dirty and paint is peeling on the electric motor. No caps or plugs were on the pump as-received. Final test date stamp on the pump is not legible. Plastic debris can be seen in the pump discharge port (captured). There is dirt/ dust in the pump inlet port. On the side of the electric motor is a two-pin connector (that was connected) but the wires leading from the connector have been cut. There is gray tape (resembles duct tape) on one of the power leads to the electric motor. All power leads to the electric motor have been cut.

Investigation:

- Residual oil sample obtained from pump inlet and captured. (Will be retained for 1 year).
- Inlet and discharge ports were flushed with Stoddard Solvent, then captured.
- Unit was clamped to the bench for operational testing.
- Red Oil MIL-PRF-5606 used on the test bench.
- Pressure and temperature transducers installed to the pump inlet and discharge lines.
- The motor and pump turn when energized with 25V.
- The pump performed per ATP when tested at the following settings:
  - o 103^0F fluid temperature

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  - 2.17 gpm
  - 25V
  - 3052 psi
  - 196.9 amps
  - See Appendix 1 for Test Results
- The unit was run for 1 minute in an attempt to see if the thermal switch opens
  - Thermal switch did not open during this run.
  - The maximum temperature of the motor case after testing was approximately 150^0F.
  - The temperature of the motor case during the test was 115^0F.
- At the direction of NTSB (Albert Nixon), the unit was energized per ATP and operated while monitoring the thermal switch continuity.
  - 8 cycles of 1 minute on; 3 minutes off while monitoring the thermal switch continuity and external motor temperature.
  - 2 cycles of 3 minutes on; 3 minutes off while monitoring the thermal switch continuity and external motor temperature.
  - Results are in Table 1 and Table 2.
  - Thermal switch opened when outside motor temperature reached 220^0F.
  - Thermal Switch closed when outside motor temperature reached 226^0F.
  - The maximum outside motor temperature achieved was 251^0F.
- Note: Radio Noise Filter box was dented during testing due to the clamp.

Summary

This pump motor package operated normally and satisfied acceptance testing per H61A1250 flow and current requirements.

Further testing was performed to determine the functionality of the thermal switch. Functionality of the thermal switch was confirmed by monitoring the continuity of the switch wires during thermal cycling.

Cycle	Motor Temp (^{0}F)	Thermal Switch Ohms
1	95.5	0.3
3	112.6	0.3
1	106	0.3
3	133.8	0.3
1	116.8	0.3
3	150.1	0.3
1	124.8	0.3
3	169.1	0.4
1	134.6	0.3
3	181.1	0.5
1	140.6	0.3
3	187.9	0.5
1	144.4	0.3
3	193.3	0.6
1	147.5	0.3
3	197.3	0.6
3	148.8	0.3
3	219.3	0.6
3	158.5	0.4
2	220	Open
3	240	Open
3	251	Open
Fan Cool	226	0.6

Table 1

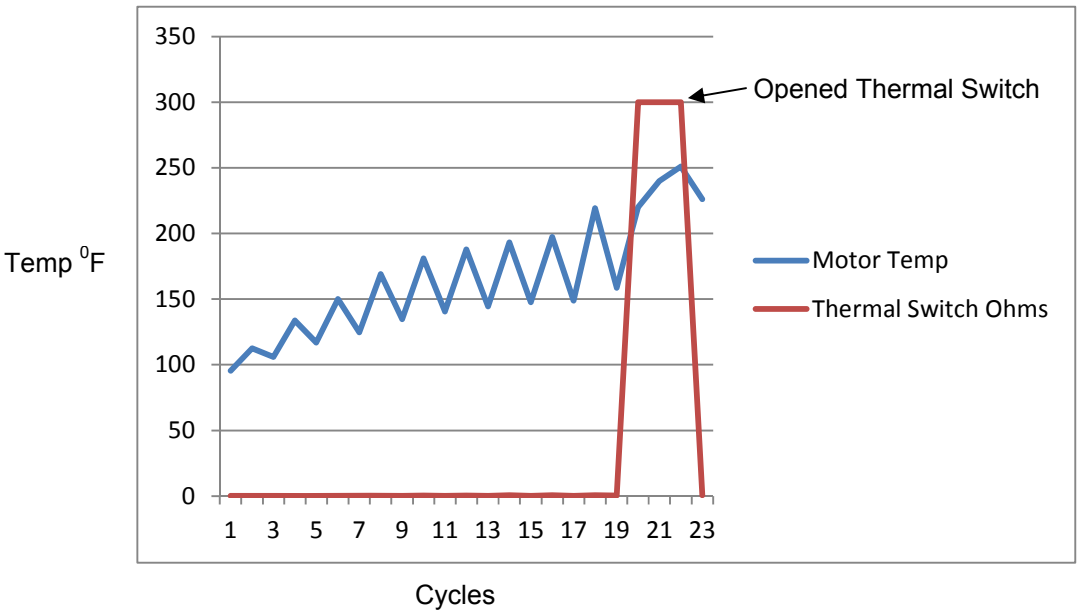
350
300
250
200
150
100
50
0
1 3 5 7 9 11 13 15 17 19 21 23
Opened Thermal Switch
Motor Temp
Thermal Switch Ohms
Temp ^{0}F
Cycles

Table 2

Engineering Evaluation

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

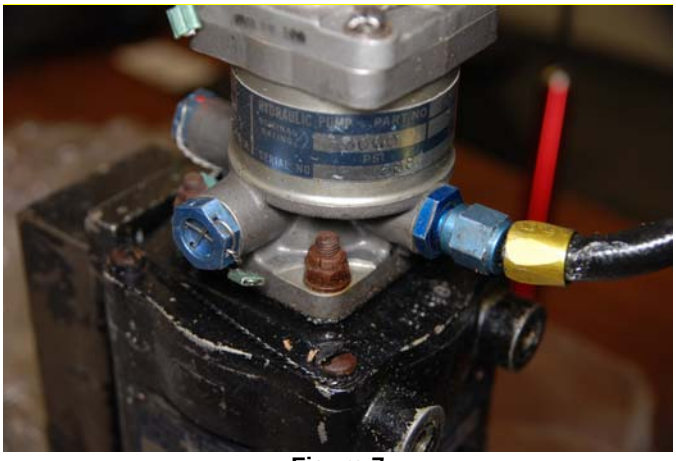

Figure 7

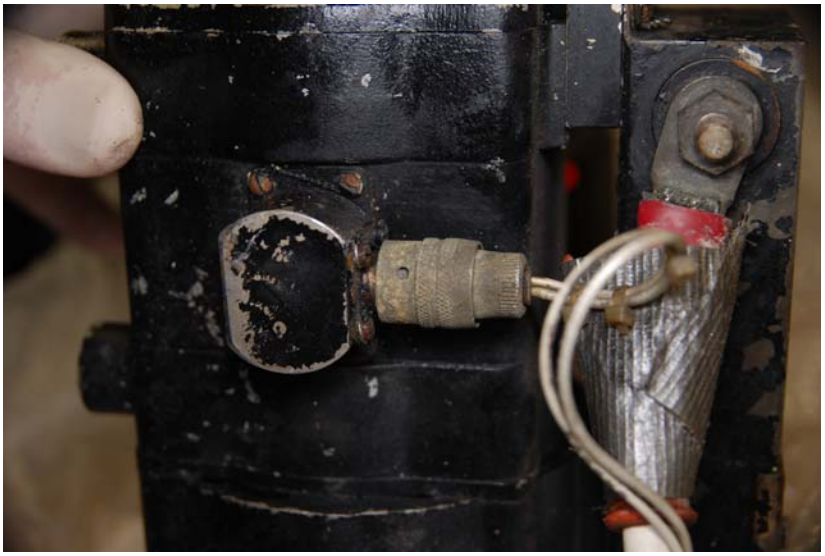

Figure 8

Figure 9

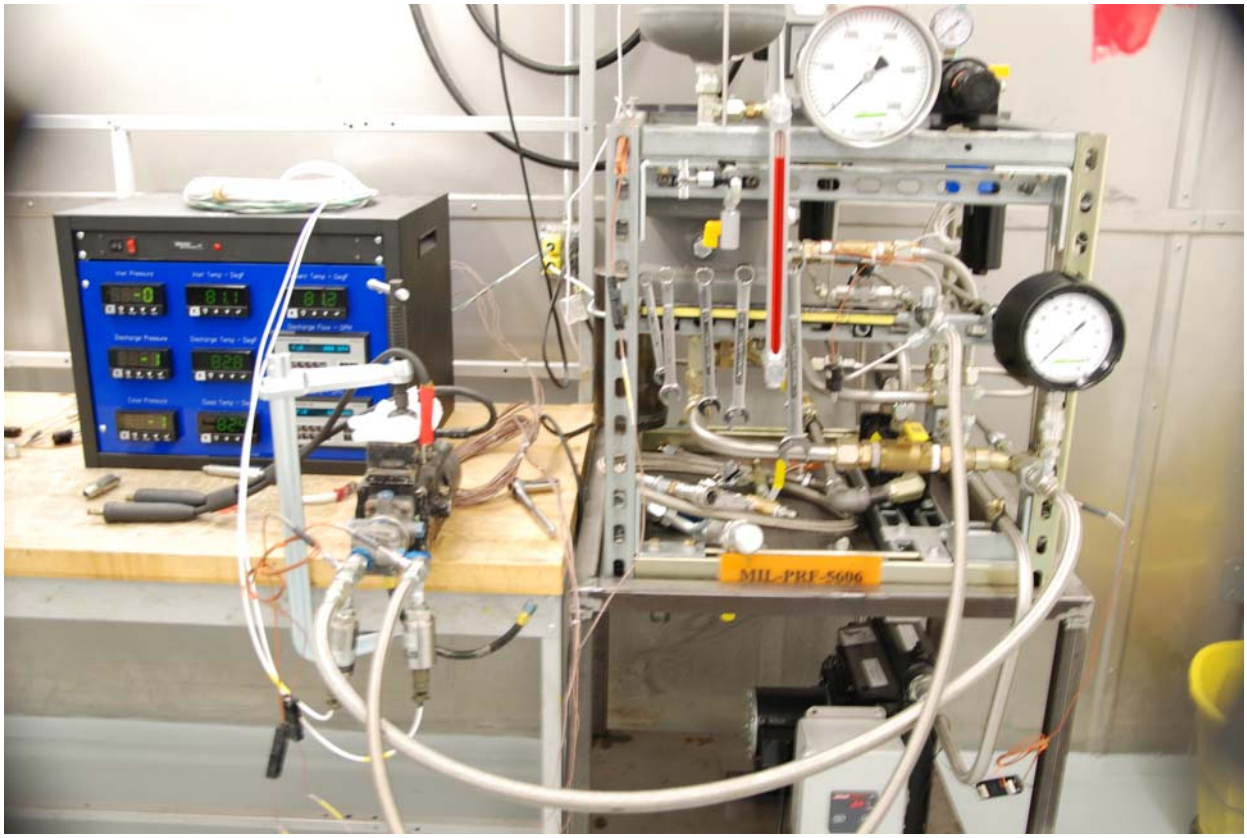

Figure 10

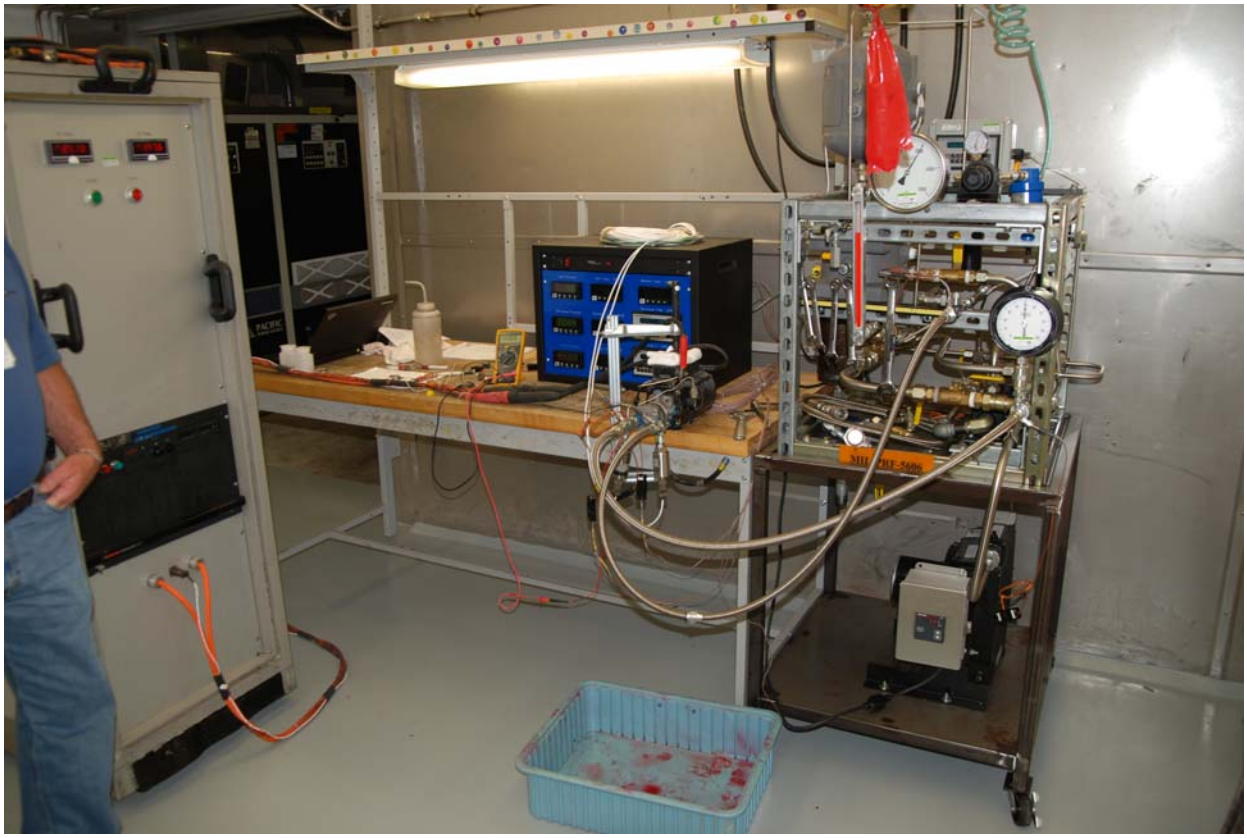

Figure 11

Appendix 1
Test Results

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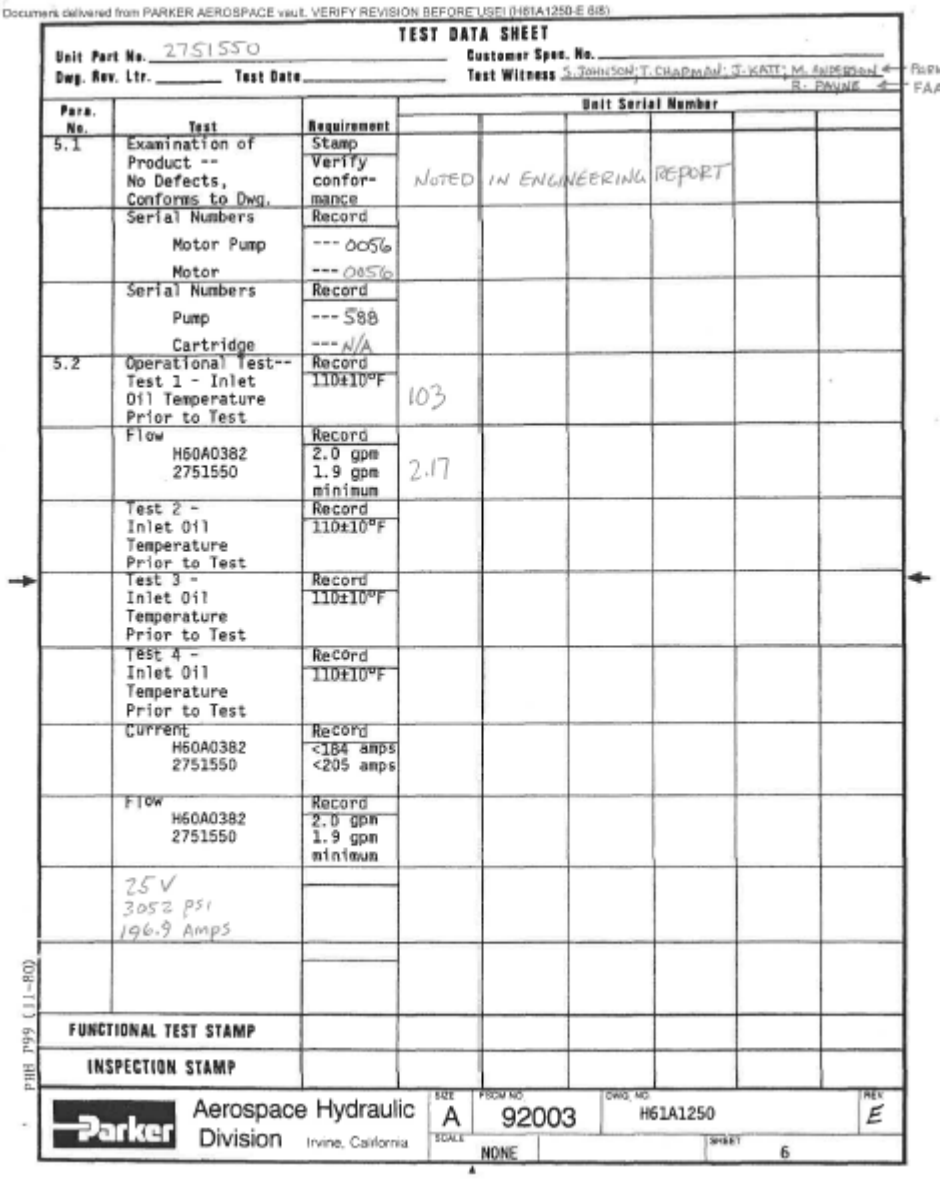

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TEST DATA SHEET

Unit Part No. 2751550 Customer Spec. No. _____

Dwg. Rev. Ltr. _____ Test Date _____ Test Witness S. JOHNSON; T. CHAPMAN; J. KATT; M. ANDERSON; R. PAYNE

Para. No.	Test	Requirement	Unit Serial Number					
5.1	Examination of Product -- No Defects, Conforms to Dwg.	Stamp Verify conformance	NOTED IN ENGINEERING REPORT					
	Serial Numbers Motor Pump Motor	Record --- 0056 --- 0056						
	Serial Numbers Pump Cartridge	Record --- 588 --- N/A						
5.2	Operational Test-- Test 1 - Inlet Oil Temperature Prior to Test	Record 110±10°F	103					
	Flow H60A0382 2751550	Record 2.0 gpm 1.9 gpm minimum	2.17					
	Test 2 - Inlet Oil Temperature Prior to Test	Record 110±10°F						
	Test 3 - Inlet Oil Temperature Prior to Test	Record 110±10°F						
	Test 4 - Inlet Oil Temperature Prior to Test	Record 110±10°F						
	Current H60A0382 2751550	Record <184 amps <205 amps						
	Flow H60A0382 2751550	Record 2.0 gpm 1.9 gpm minimum						
	25 V 3052 PSI 196.9 Amps							
	FUNCTIONAL TEST STAMP							
	INSPECTION STAMP							

Parker Aerospace Hydraulic Division Irvine, California | SIZE A | PSCM NO. 92003 | DWG. NO. H61A1250 | REV. E | SCALE NONE | SHEET 6

PMH 7/99 (11-80)

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