Aviation Investigation Final Report

Location:	Whiteville, North Carolina	**Accident Number:**	ERA10LA004
Date & Time:	October 3, 2009, 19:30 Local	**Registration:**	N8809C
Aircraft:	Piper PA-32R-300	**Aircraft Damage:**	Substantial
Defining Event:	Hard landing	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported a complete loss of electrical power and that he was unable to lower the landing gear as a result. Several attempts to lower the landing gear using the emergency procedures published in the Pilot's Operating Handbook were also unsuccessful. A mechanic and the pilot reviewed the procedure by cellular telephone as the airplane circled over the airport, but the landing gear would not deploy. After an estimated 90 minutes of maneuvering and troubleshooting, the pilot announced that he would land the airplane with the gear up. According to the mechanic, the airplane was at low altitude over the approach end of the runway when the pilot "chopped the power." He said, "He chopped the power too high, and didn't have enough 'flare speed' and hit the runway pretty hard." Examination of the airplane at the scene revealed substantial damage to the firewall, fuselage, and empennage structures. Detailed examination of the airplane by the mechanic and Federal Aviation Administration inspectors revealed that the air conditioning compressor had seized, the compressor belt had broken, which then fouled the alternator belt. Once the alternator belt broke, the battery power was exhausted, and the airplane experienced a complete electrical failure. Examination of the landing gear revealed that with electrical power applied, the landing gear would operate as designed. With electrical power removed, the "emergency down valve" which allowed the gear to free-fall into position, would not release the hydraulic pressure to allow the gear to lower. Instead, the pressure was released by opening a hydraulic line, and the gear then lowered as designed. The emergency down valve was found with blockage. The aircraft manufacturer calls for the landing gear system to be tested each 100 flight hours. The last inspection was performed 10.5 months and 20 flight hours before the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's improper flare and subsequent hard landing during an intentional gear-up landing following multiple mechanical malfunctions. Also causal to the accident was an inoperative landing gear emergency-down valve which had blockage for undetermined reasons.

Findings

Aircraft	Gear extension and retract sys - Inoperative
Aircraft	Landing flare - Not attained/maintained
Personnel issues	Incorrect action performance - Pilot

Factual Information

History of Flight

Enroute-cruise	Electrical system malf/failure
Approach	Sys/Comp malf/fail (non-power)
Landing-flare/touchdown	Landing gear not configured
Landing-flare/touchdown	Hard landing (Defining event)

HISTORY OF FLIGHT

On October 3, 2009, about 1930 eastern daylight time, a Piper PA-32R-300, N8809C, was substantially damaged during a gear-up landing at Columbus County Municipal Airport (CPC), Whiteville, North Carolina. The certificated private pilot and passenger were not injured. Visual meteorological conditions prevailed for the local personal flight that originated at CPC, at 1730, and was conducted under the provisions of 14 Code of Federal Regulations Part 91.

In a telephone interview, one witness, a certificated airframe and powerplant mechanic, stated that he was working at the airport when he noticed the airplane maneuvering around the airport. Soon after, the pilot contacted the airport manager by cellular telephone and then spoke to the mechanic directly.

According to the mechanic, the pilot reported a complete loss of electrical power, and that he was unable to lower the landing gear as a result. Several attempts to lower the landing gear using the emergency procedures published in the Pilot's Operating Handbook were also unsuccessful. The mechanic stated that while the telephone connection was weak, he was sure that he and the pilot reviewed the procedure properly, and that the gear would not deploy.

After an estimated 90 minutes of maneuvering and troubleshooting, the pilot announced that he was low on fuel, running out of daylight, and would land the airplane gear-up. The mechanic advised the pilot to land on the pavement, and not in the grass.

According to the mechanic, the airplane was at low altitude over the approach end of the runway when the pilot "chopped the power." He said, "He chopped the power too high, and didn't have enough 'flare speed' and hit the runway pretty hard."

In a telephone interview, the pilot provided a similar accounting of events. He said that there were two different procedures for the emergency lowering of the landing gear, neither of which worked. The pilot stated that after he decided to land the airplane gear-up, he entered a left hand traffic pattern, and completed the "gear-up landing procedure" by the checklist.

PERSONNEL INFORMATION

A review of Federal Aviation Administration (FAA) airman records revealed that pilot held a private pilot certificate with a rating for airplane single engine land. His most recent FAA third class medical certificate was issued in January 2008. The pilot reported 320 total hours of flight experience with 88 total hours in the accident airplane make and model.

AIRCRAFT INFORMATION

According to FAA and maintenance records, the airplane was manufactured in 1976 and had accrued 3,902 total aircraft hours. Its most recent annual inspection was completed in November 20, 2008, at 3,882 total aircraft hours.

METEOROLOGICAL INFORMATION

At 1934, the weather reported at CPC included clear skies and winds from 190 degrees at 5 knots. The visibility was 10 miles. The temperature was 24 degrees Celsius (C) and the dew point was 19 degrees C.

WRECKAGE AND IMPACT INFORMATION

Examination of the airplane at the scene revealed substantial damage to the firewall, fuselage, and empennage structures. According to the mechanic, during the recovery, the airplane was raised and the landing gear “just came down by itself.”

Detailed examination of the airplane by the mechanic revealed that the air conditioning compressor had seized, the compressor belt had broken, which then fouled the alternator belt. According to the mechanic, once the alternator belt broke, the battery power was exhausted, and the airplane experienced a complete electrical failure

On October 5, 2009, the airplane was examined by an FAA aviation safety inspector, who confirmed the damage as well as the diagnosis of the original malfunction offered by the mechanic. Examination of the landing gear revealed that with electrical power applied, the landing gear would operate as designed. With electrical power removed, the “emergency down valve” which allowed the gear to free-fall into position was "stuck," and would not release the hydraulic pressure to allow the gear to lower. Instead, the pressure was released by opening the hydraulic line, and the gear then lowered as designed. According to the mechanic, "We concluded the valve was stopped up internally and did not release pressure when actuated. We did not remove the valve or have it tested."

ADDITIONAL INFORMATION

According to the Piper Cherokee Six/Lance Service manual, the inspection of the entire landing gear system, with operational checks, should be performed every 100 flight hours. The airplane had accrued only 20 total flight hours during the nearly 10.5 months that had elapsed since the

airplane's last annual inspection.

Pilot Information

Certificate:	Private	**Age:**	43,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	January 31, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	320 hours (Total, all aircraft), 88 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N8809C
Model/Series:	PA-32R-300	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-7680139
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	November 20, 2008 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	20 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3902 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TI0-540 SER
Registered Owner:	CAROLINAS AVIATION LLC	**Rated Power:**	310 Horsepower
Operator:	CAROLINAS AVIATION LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/bright
Observation Facility, Elevation:	CPC,99 ft msl	**Distance from Accident Site:**	
Observation Time:	19:34 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.87 inches Hg	**Temperature/Dew Point:**	24°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Whiteville, NC (CPC)	**Type of Flight Plan Filed:**	Unknown
Destination:	Whiteville, NC (CPC)	**Type of Clearance:**	None
Departure Time:	17:30 Local	**Type of Airspace:**	

Airport Information

Airport:	Columbus County Municipal CPC	**Runway Surface Type:**	Asphalt
Airport Elevation:	99 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	24	**IFR Approach:**	None
Runway Length/Width:	5500 ft / 75 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	34.270278,-78.708885(est)

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	Jeff Riddell; FAA/FSDO; Greensboro, NC
Original Publish Date:	December 20, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=74846