Aviation Investigation Final Report

Location:	Clinton, Oklahoma	**Accident Number:**	DFW07LA108
Date & Time:	May 11, 2007, 12:50 Local	**Registration:**	N4413Q
Aircraft:	Cessna A188A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious
Flight Conducted Under:	Part 137: Agricultural		

Analysis

As the agricultural pilot was pulling up from a low level pass, he smelled something "like wires burning" and observed the engine's fuel pressure drop. The pilot selected the auxiliary fuel pump's "EMERGENCY" position and five to ten seconds later the engine lost partial power. Not able to maintain altitude, the pilot elected to land the airplane to a rolling wheat field. During landing, the airplane nosed over and came to rest in an inverted position. An examination of the airplane revealed that, prior to impact, the engine exhaust stack had separated from the muffler. Hot exhaust gasses, that are normally vented overboard, were directed to the airplanes firewall, resulting in thermal damaged to electrical wiring and a vapor condition in the fuel gascolator. The pilot attempted to purge the vapor to no avail. No other pre impact anomalies were noted with the engine or the fuel system that would have prevented normal operating power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Separation of the exhaust stack and resulting vapor lock. A contributing factor was the none suitable terrain for the forced landing.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: MANEUVERING - AERIAL APPLICATION

Findings
1. (C) EXHAUST SYSTEM,STACK - FAILURE

Occurrence #2: LOSS OF ENGINE POWER(PARTIAL) - NONMECHANICAL
Phase of Operation: MANEUVERING

Findings
2. (C) FLUID,FUEL - VAPOR LOCK

Occurrence #3: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #4: NOSE OVER
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
3. (F) TERRAIN CONDITION - NONE SUITABLE

Factual Information

On May 11, 2007, about 1250 central daylight time, a single-engine Cessna A188A airplane, N4413Q, was substantially damaged during a forced landing following a partial loss of engine power near Clinton, Oklahoma. The airline transport pilot, the sole occupant, sustained serious injuries. The airplane was registered to and operated by the pilot. Visual meteorological conditions prevailed and a flight plan was not filed for the 14 Code of Federal Regulations part 137 aerial application flight. The local flight originated from Clinton Regional Airport (CLK), Clinton, Oklahoma at 1157.

According to the pilot, age 35, as he was pulling up from a low level pass, he smelled something "like wires burning" and observed the engine's fuel pressure drop to approximately six gallons per hour (GPH). The pilot selected the auxiliary fuel pump's "EMERGENCY" position which resulted in an increase in fuel pressure to about 22 GPH. Approximately five to ten seconds later the engine's fuel pressure again dropped to approximately six gallons per hour. Not able to maintain altitude, the pilot elected to land the airplane to a rolling wheat field. Prior to landing, the pilot shut off the engine magnetos and master switch. During landing, the airplane nosed over and came to rest in an inverted position. A post impact fire did not occur.

A Federal Aviation Administration (FAA) inspector responded to the accident site. According to the inspector, the airplane sustained substantial damage to the vertical stabilizer and both wings. The inspector further reported that aviation fuel was found in the airplane's main fuel tanks and in the engine's fuel manifold.

The NTSB investigator-in-charge (IIC) and a representative from Teledyne Continental Motors examined the airplane following its recovery. The examination revealed that prior to impact, the engine exhaust stack had separated from the muffler. The electrical wiring attached to the firewall in the area behind the muffler was found thermally damaged. The fuel gascolator was also attached to the firewall in this area. No other pre impact anomalies were noted with the engine or the fuel system that would have prevented normal operating power.

According to the Cessna Agwagon Owners Manual dated 1970/71, page 2-12, "...if fuel vapor is affecting engine operation, the vapor may be purged by placing the switch in the "EMERGENCY" position while leaning the mixture as required to prevent excessively rich mixture. Successful vapor purging is evidenced by smooth engine operation and steady and normal fuel flow indications with the auxiliary fuel pump switch "OFF.""

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	35,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	March 1, 2007
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	September 1, 2006
Flight Time:	7230 hours (Total, all aircraft), 650 hours (Total, this make and model), 6050 hours (Pilot In Command, all aircraft), 105 hours (Last 90 days, all aircraft), 73 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N4413Q
Model/Series:	A188A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	18800813
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	March 1, 2007 Annual	**Certified Max Gross Wt.:**	4000 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	5678 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Not installed	**Engine Model/Series:**	IO-520-D
Registered Owner:	Chad Wright	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	Wright Air, Inc.	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CLK,1615 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	11:55 Local	**Direction from Accident Site:**	350°
Lowest Cloud Condition:	Scattered / 3900 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 7000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	20°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.11 inches Hg	**Temperature/Dew Point:**	23°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Clinton , OK (CLK)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	11:57 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	35.536666,-98.913887

Administrative Information

Investigator In Charge (IIC):	LeBaron, Timothy
Additional Participating Persons:	Mike Boler; Federal Aviation Administration; Oklahoma City, OK John Kent; Teledyne Continental Motors; Mobile, AL
Original Publish Date:	April 30, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65762