Aviation Investigation Final Report

Location:	GOOSE LAKE, Iowa	**Accident Number:**	CHI96LA020
Date & Time:	October 26, 1995, 19:23 Local	**Registration:**	N185F
Aircraft:	CESSNA 180A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

THE PILOT/OWNER WAS FLYING AN AIRPLANE THAT HAD RECENTLY UNDERGONE A COMPLETE OVERHAUL OF THE ENGINE AND REPLACEMENT OF THE RIGHT FUEL TANK BLADDER. AFTER BEING EN ROUTE FOR ABOUT 1 HOUR AND 50 MINUTES, THE ENGINE STOPPED RUNNING WITH NO WARNING. DURING A SUBSEQUENT FORCED LANDING IN A CORN FIELD, THE AIRPLANE NOSED OVER AND WAS DAMAGED. INSPECTION OF THE AIRPLANE REVEALED A WRINKLED RIGHT BLADDER FUEL TANK AND A FUEL STAIN AFT OF THE LEFT FUEL CAP. VERY LITTLE FUEL WAS FOUND ONBOARD. FOUR GALLONS OF FUEL WAS ADDED TO THE LEFT TANK AND THE ENGINE RAN SUCCESSFULLY. THE AIRPLANE HAD BEEN MODIFIED WITH SUPPLEMENTAL TYPE CERTIFICATE (STC) SA4121SW. HOWEVER, THERE WAS NO MAINTENANCE ENTRY IN THE AIRPLANE'S LOGBOOK REGARDING THE MAINTENANCE PERFORMED TO COMPLY WITH ALL CONDITIONS OF THE STC. CESSNA SERVICE BULLETIN (SB) SEB88-1 WAS APPLICABLE TO THE STC. AN INSTRUCTION OF THE SB WAS ' . . . TO ADD A STRIP OF FOAM SEAL AROUND THE WING STRUT UNDER THE UPPER STRUT CUFF. THIS SEALING PREVENTS AIR FLOWING INSIDE THE CUFF AND DISRUPTION OF PROPER FUEL VENTING DUE TO VORTEX GENERATION FORWARD OF THE VENT TUBE . . .' THE SB ALSO NOTED THAT EXCESSIVE GAPS BETWEEN THE WING STRUT AND STRUT CUFF COULD CAUSE FUEL BLADDER TANK WRINKLING, UNSNAPPING AND INACCURATE FUEL QUANTITY INDICATIONS.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: inadequate maintenance, inadequate preflight by the pilot, and a loose fuel tank cap that allowed siphoning of fuel, buckling of the right fuel bladder, fuel exhaustion, and loss of engine power. Factors relating to the accident were: darkness, and the soft terrain and crop in the

emergency landing area.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: CRUISE

Findings
1. (C) MAINTENANCE - INADEQUATE - OTHER MAINTENANCE PERSONNEL
2. (C) FUEL SYSTEM,CAP - LOOSE
3. (C) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
4. (C) FUEL SYSTEM - SIPHONING
5. (C) FUEL SYSTEM,TANK - BUCKLED
6. (C) FLUID,FUEL - EXHAUSTION

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: NOSE OVER
Phase of Operation: EMERGENCY LANDING

Findings
7. (F) LIGHT CONDITION - DARK NIGHT
8. (F) TERRAIN CONDITION - CROP
9. (F) TERRAIN CONDITION - SOFT

Factual Information

On October 26, 1995, at 1923 central daylight time, a Cessna 180A, N185F, operated and owned by an instrument rated commercial pilot, was substantially damaged following a loss of engine power and subsequent forced landing on a field near Clinton, Iowa. The pilot reported no injuries. No flight plan was on file. The personal 14 CFR Part 91 flight had departed Anoka County-Blaine- Janes Field, Minneapolis, Minnesota, at 1725, en route to Greater Peoria Regional Airport, Peoria, Illinois.

From the pilot's written statement, the airplane had recently undergone a complete overhaul on the engine. He had fueled the airplane with five hours (65 gallons) of usable fuel and completed a satisfactory leak check before taking off. After one hour and fifty minutes en route at 4500 feet mean sea level (MSL), with the carburetor heat on, and the fuel selector on both tanks, the engine stopped with no warning. A forced landing was performed in a farm field with the airplane coming to rest inverted.

A mechanic who inspected the airplane after the accident stated he turned the airplane back on to its wheels and found very little fuel onboard. No fuel came out of the carburetor inlet hose. The right fuel tank bladder was severely wrinkled and the left fuel cap had apparent fuel stains running aft. The fuel tank vent pipe was not plugged. He added four gallons of fuel to the left fuel tank and ran the engine successfully.

The Federal Aviation Administration inspector's statement, said that the left fuel cap was loose when latched. Fuel stains were evident aft of the left cap. The right bladder fuel tank was crumpled up with three outboard fuel snaps found unsnapped. The pilot said that the right fuel tank was recently replaced. He said that a supplemental type certificate (STC)# SA4121SW that involves adding wing strut fairings and contour wing struts, was performed, but did not know who performed the work. This STC if installed reduces the flow separation at the junctions of the struts and fuselage. There was no maintenance entry in the airplane's logbook on STC #SA4121SW which also involves Cessna Service Bulletin SEB88-1, which states, "...to add a strip of foam seal around the wing strut under the upper strut cuff. This sealing prevents air flowing inside the cuff and disruption of proper fuel venting due to vortex generation forward of the vent tube, which is located immediately aft of the strut cuff... ." If the Cessna Service Bulletin SEB88-1 is not performed or performed incorrectly, there is a note that states, "...Note: Excessive gaps between the wing strut and strut cuff can cause fuel bladder tank wrinkling, unsnapping and inaccurate fuel quantity indications... ."

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	75,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	October 13, 1994
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	13750 hours (Total, all aircraft), 5000 hours (Total, this make and model), 65 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	**Registration:**	N185F
Model/Series:	180A 180A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	50123
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	Annual	**Certified Max Gross Wt.:**	2650 lbs
Time Since Last Inspection:	100 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3750 Hrs	**Engine Manufacturer:**	CONTINENTAL
ELT:	Installed, not activated	**Engine Model/Series:**	O-470-K
Registered Owner:	FOX, JOSEPH P.	**Rated Power:**	230 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	DBQ ,1473 ft msl	**Distance from Accident Site:**	29 Nautical Miles
Observation Time:	19:56 Local	**Direction from Accident Site:**	150°
Lowest Cloud Condition:	Thin Overcast / 7000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 10000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	12°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	MINNEAPOLIS , MN (ANE)	**Type of Flight Plan Filed:**	None
Destination:	PEORIA , IL (PIA)	**Type of Clearance:**	VFR on top
Departure Time:	17:35 Local	**Type of Airspace:**	Class E

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	41.959026,-90.380935(est)

Administrative Information

Investigator In Charge (IIC):	Carlson, Todd
Additional Participating Persons:	RONNIE L DRISKILL; DES MOINES , IA MICHAEL L MCPEAK; DES MOINES , IA
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Investigation Class:	Class
Note:	
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