

**NATIONAL TRANSPORTATIONS SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594**

SUMMARY OF ACCIDENT SITE AND AIRCRAFT EXAMINATIONS

-- CEN17FA147 --

A. ACCIDENT

Location: Oxford, Iowa
Date: April 7, 2017
Time: 1507 central daylight
Aircraft: Piper PA-28-180 (s/n 28-3245, N9179J)

B. PARTICIPANTS

Pam Sullivan
Senior Air Safety Investigator
National Transportation Safety Board

Michael W. Newhall
Principal Maintenance Inspector
Federal Aviation Administration – Flight Standards

Damian Galbraith
Air Safety Investigator
Piper Aircraft, Inc.

John Butler
Air Safety Investigator
Lycoming

C. ACCIDENT SUMMARY

On April 7, 2017, about 1507 central daylight time, a Piper PA-28-180 airplane, N9179J, collided with the terrain in Oxford, Iowa, following a loss of control. The certified flight instructor (CFI) and private pilot were both fatally injured. The airplane was destroyed by impact forces and a postimpact fire. The airplane was registered to Green Castle Aero Club LTD and was being operated by the CFI as a 14 Code of Federal Regulations Part 91 training flight. Visual flight rules conditions existed near the accident site at the time of the accident, and a flight plan had not been filed for the local flight. The airplane departed the Green Castle Airport (IA24), about 1445.

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D. GENERAL DESCRIPTION

Airframe

The Piper PA-28-180 Cherokee is a four-place, single-engine airplane, low-wing airplane with fixed tricycle landing gear. The airplane is certificated as both a normal and utility category airplane, depending on the operating weight and center of gravity.

Engine Assembly

The Lycoming O-360-A3A engine is capable of producing 180 horsepower at 2,700 rpm. The engine is a direct drive, four cylinder, carbureted, horizontally opposed, normally aspirated, air cooled engine with down exhaust.

E. DETAILS OF AIRCRAFT EXAMINATIONS

The on-scene examination was conducted on April 8, 2017. The airplane was relocated from the accident site to a hangar at the Iowa City Municipal Airport, Iowa City, Iowa, where the wreckage examination continued on April 9, 2017.

All examinations and testing were completed under the direct supervision of the NTSB investigator-in-charge. Piper Aircraft and Lycoming provided technical support to the investigation as a party to the NTSB.

F. DESCRIPTION OF ACCIDENT SITE

The airplane came to rest upright in a plowed corn field southeast of the intersection of IWV Road SW and Greencastle Ave SW. The coordinates for the accident site are 41° 39'11"N 91° 42'25" W. The wreckage was upright and had been sustained impact damage and was partially consumed by a postimpact fire.

Other than minor debris, the wreckage was contained in one area. The furthest piece of wreckage was the top engine cowling which was located about 36 ft from the main wreckage. A burned area surrounded the wreckage which extended out to a maximum of about 50 ft from the wreckage.

The airplane and engine sustained impact and fire damage. The front of the engine was partially buried in the soft terrain and it came to rest in a near 60° nose down attitude. The propeller was buried in the ground with the tip of one of the blades visible.

G. SUMMARY OF AIRCRAFT EXAMINATIONS

Airframe – Piper PA-28-180, s/n 28-3245

The left wing remained attached to fuselage and was partially consumed by the fire. The leading edge of the entire wing was crushed aft. The left-wing tip and the fuel tank were consumed by fire. The fuel pick-up screen was free of obstruction and the fuel cap was secured in place. The left aileron remained attached to its mounts. The inboard section of the aileron sustained fire damage and the outboard section was consumed by the fire. The aileron balance weight remained attached to its mount. The forward aileron travel stop showed no signs of repeated contact and the rear travel stop was bent. The left aileron drive cable remained attached to the bellcrank and to the T-bar chain. The aileron balance

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cable was separated about 76 inches from the bellcrank and the cable ends were frayed. Control continuity was established except for impact separation. The outboard 36 inches of the flap remained attached to the wing by the outboard hinge. The inboard section of the flap was consumed by fire. The flap push-pull rod remained attached to the flap torque tube. The flap torque tube position indicated the flaps were not extended. The pitot head, static port, and vent were clear, however, the pitot port was blocked with material consistent with dirt from the site. The structure surrounding the pitot head was consumed by fire. The landing gear oleo strut was separated from the trunnion. The stall vane was damaged/missing and could not be functionally checked.

The right wing remained attached to the fuselage with the leading edge crushed aft. The outboard 46-inch section of the wing was partially separated from the main spar and was twisted upward. Wrinkles in the outboard section of the wing were angled at 45°. The right fuel tank was consumed by fire. The fuel screen was free of obstructions and the fuel cap was secured. The flap was consumed by fire. The remaining steel parts of the flap remained attached to the flap torque tube. The position of the torque tube indicated the flaps were retracted. The aileron remained attached to its mounts and was partially consumed between the inboard and outboard ends. The aileron balance weight remained attached. The right wing navigational light was separated from the consumed wing tip. The aileron forward and rear travel stops did not show any signs of repeated contact. The aileron drive cable remained attached to the bellcrank and to the T-bar chain. The aileron balance cable was separated in the centerboard area. Control continuity was established except for impact separation. The landing gear oleo strut was separated from the trunnion.

The rudder remained attached to the vertical stabilizer which was separated from the fuselage due to fire damage. The rudder balance weight was consumed by fire as evidenced by the melted lead found on top of the inboard section of the stabilator. The rudder cables remained attached to the rudder torque tube. Control continuity was established from the control surface to the rudder pedal assembly. The rudder travel stops did not indicate any signs of repeated contact. The right side of the vertical stabilizer and rudder were consumed by fire.

The stabilator remained attached to its mounts. The four stabilator travel stops did not show any signs of repeated contact. The right hand top side of the stabilator was partially consumed by fire. The balance weight remained attached to the balance tube. The balance tube was partially separated from the stabilator. The control cables remained attached to the balance weight mast. Control continuity was established from the T-bar to the stabilator balance weight. The stabilator trim tab remained attached to the stabilator. The stabilator trim barrel was partially consumed by fire. The stabilator trim barrel exhibited a neutral to slight nose up trim. The stabilator trim rod was attached to the trim tab but was separated at the trim barrel assembly due to fire damage.

The fuselage was mostly consumed by fire. The seats were fragmented and separated from the fire consumed seat tracts. The seat belts were consumed. The cabin door remained attached to the fuselage. The door sustained impact and fire damage and it was partial separated. The door latch was found in the latched position. The instrument panel was destroyed by impact and fire damage. The throttle and mixture controls were in the full forward positions. The fuel selector was tested and found to be functional and positioned on the left fuel tank. The gascolator drain was closed and the bowl was partially separated. The filter screen was clean of debris and no fuel was present,

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however, the area sustained significant fire damage. The electric fuel pump sustained fire damage. The screen was removed and was clear of debris. The ELT was not located.

Engine – Lycoming O-360-A3A, s/n RL-12326-36A

The firewall remained attached to the engine and engine mounts.

The exhaust system sustained impact damage.

The alternator was impact damage with the brace arm was broken out of the crankcase.

The engine data plate was partially dislodged from the attach point on the crankcase.

The oil cooler was dislodged and breached from impact damage.

All fluid carrying lines were destroyed by impact and the postimpact fire.

The engine driven fuel pump was sustained impact and fire damage.

All rocker covers were removed and top spark plugs were removed from the engine. The exhaust heat exchanger, propeller, and remaining accessories were also removed. A turning tool was inserted in to the vacuum pump drive housing and the engine was rotated by hand. It furnished suction and compression at all cylinders and the rear accessory gears were observed turning. Valve train and crankshaft continuity was established throughout the engine.

The exhaust heat exchanger was removed and examined; it had sustained damage due to impact forces. No pre-impact abnormalities were observed during the examination of the exchanger.

Fuel Pump - Model AF-15472

The engine driven diaphragm fuel pump was impact destroyed.

Carburetor – Marvel – No data tag present.

No fuel was observed during the examination.

The carburetor separated from the engine at the venturi throat, the throttle plate was observed closed. All control cables and linkages were impact damaged and their positions could not be ascertained. The carburetor was photo documented and noted that the data plate was not recovered. The inlet suction screen was removed and examined, it was observed free of contaminants. The unit was disassembled, and it was observed that it contained metal floats, the floats were observed loose in the carburetor bowl (the solder that attaches them to the lifting arm had melted). Both metal floats were hydraulic damaged.

Plugs – Champion REM-40E – The bottom No 1 and 2 plugs were not removed due to the exhaust system being impact crushed around them. The remainder of the plugs showed severe wear as compared to the Champion Aviation Check-A-Plug chart.

The ignition harness was impact destroyed.

The starter was not removed or tested.

The alternator was destroyed by impact.

Magnetos – Slick

Both magnetos sustained fire damage.

Right – 4370 s/n 09053306

The right magneto was separated from the engine. The drive shaft could not be rotated by hand, it was disassembled and was observed fire destroyed.

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Left – 4373 s/n 05051967

The left magneto could not be rotated by hand. It was disassembled and was observed fire destroyed.

The ignition harness was destroyed.

Vacuum Pump - This unit was secure on its mount. It was removed, and the drive coupling was destroyed by fire. The unit was disassembled, and no pre-impact anomalies were noted. There was no data tag on the pump.

Lubrication System - The oil system was thermal damaged; no oil was observed during the engine examination. The oil filter was fire destroyed. The oil screen was removed and observed free of contaminants. The oil filter paper element was destroyed by the fire.

Nothing was observed during the course of this engine examination that would have precluded normal operation prior to the impact and postimpact fire.

Propeller Assembly – Sensenich EM8S5-0-58, s/n 29046K

The propeller remained attached to the propeller crankshaft. One propeller blade was straight with a slight twist on the outboard section of the blade. The other blade was bent rearward beginning mid-span with a slight twist near the outboard section of the blade.