National Transportation Safety Board
Aviation Accident Final Report

Location:	Ankeny, IA	**Accident Number:**	CHI06FA026
Date & Time:	11/08/2005, 1017 CST	**Registration:**	N27177
Aircraft:	Piper PA-31-350	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The twin-engine airplane was destroyed by impact with terrain about 2.5 miles northeast of the airport while returning to the airport with an engine problem. A witness reported that the FAR Part 135 on-demand passenger flight had been scheduled for a 0900 departure, but because the flight had not been confirmed, a pilot was not scheduled to fly the flight. The accident pilot arrived at the airport about 1005. A witness reported that the pilot was not in the office for more than two minutes when he "grabbed the status book," walked straight to the airplane, and boarded. A lineman serviced both engines at 0930 with oil, but failed to put the dipstick back in the right engine oil filler tube. Witnesses reported that they did not see the pilot perform a preflight. The pilot was unaware that the dipstick was left on the right wing of the airplane. The pilot taxied the airplane forward about 5 feet and abruptly stopped and shut down both engines. The pilot got out of the airplane. The lineman reported that he approached the pilot and asked what was wrong. The lineman reported that the pilot closed the oil flap door on the right engine, and said that the oil flap door had been left open. The pilot restarted the engines and departed about 1008. About three minutes after takeoff, the pilot informed departure control that he needed to return to the airport due to an oil leak. The pilot reported over the Unicom radio frequency that he was returning because he was having trouble with the right engine. Radar track data indicated that about 1013, the airplane's position was about 1.5 miles directly north of the airport about 1,800 feet msl, heading south at 126 knots calibrated airspeed (CAS). The airplane continued to fly south directly to the airport. The radar track data indicated that instead of landing on runway 18, the airplane flew over the airport, paralleling runway 18. About 1014, the airplane's position was over the airport at an altitude of about 1,460 feet msl (550 feet above ground level), heading south at about 97 knots CAS. The airplane continued to fly south past the airport, entered a left turn, and turned back to the north. The last radar return was recorded about 1016. The airplane's position was approximately 1.5 miles east of the approach end of runway 18 at an altitude of about 1,116 feet msl (344 feet agl), heading north at about 99 knots CAS. The impact site was located about 2.5 miles north of the last radar return. A witness, located about 1/4 mile from the accident site, observed the airplane flying "really low." He reported, "The motor on the plane wasn't cutting out or sputtering." Another witness reported, "The plane lifted up over power lines then went across a field about 50 to 80 ft off ground." The airplane impacted a harvested cornfield in a

steep nose-down attitude, and traveled 45 feet before stopping. The inspection of the airplane revealed that the landing gear was down, flaps were found in a 20-degree down position, and neither propeller was feathered. The post accident inspection of the airplane's engines and airframe revealed no preexisting anomalies that could be associated with a pre-impact condition.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to preflight the airplane, the pilot's improper in-flight decision not to land the airplane on the runway when he had the opportunity, and the inadvertent stall when the pilot allowed the airspeed to get too low. Factors that contributed to the accident were the lineman's improper servicing of the airplane when he left the oil dipstick out and the subsequent oil leak.

Findings

Occurrence #1: MISCELLANEOUS/OTHER
Phase of Operation: CRUISE

Findings
1. (F) AIRCRAFT SERVICE - IMPROPER - COMPANY MAINTENANCE PERSONNEL
2. (C) AIRCRAFT PREFLIGHT - NOT PERFORMED - PILOT IN COMMAND
3. (F) LUBRICATING SYSTEM,OIL FILLER CAP - NOT CONNECTED
4. (F) FLUID,OIL - LEAK

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. (C) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
6. (C) AIRSPEED - LOW - PILOT IN COMMAND
7. STALL - INADVERTENT - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
8. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On November 8, 2005, at 1017 central standard time, a Piper PA-31-350, N27177, operated by Exec 1 Aviation, was destroyed by impact with terrain about 2.5 miles northeast of the Ankeny Regional Airport (IKV), Ankeny, Iowa. The pilot reported that he was experiencing a problem with the right engine and was returning to land at IKV. The airline transport pilot and pilot-rated passenger received fatal injuries. The 14 Code of Federal Regulations Part 135 on-demand passenger flight departed IKV at 1007 en route to the Emmetsburg Municipal Airport (EGQ), Emmetsburg, Iowa. Visual meteorological conditions prevailed at the time of the accident. An instrument flight rules (IFR) flight plan was filed.

The employee of Exec 1 Aviation who scheduled customer flights reported that the accident flight had been scheduled for a 0900 departure on November 8, 2005, but it had not been confirmed, as most flights usually were. The passenger arrived at 0900 for the flight, but because the flight had not been confirmed, a pilot was not scheduled to fly the flight. The flight scheduler called the pilot who assisted in scheduling pilots for flights, but he was unavailable to fly. Another pilot was called, but he too was unavailable to fly. The flight scheduler called the accident pilot, who lived near the airport, about 0920 and he said that he would accept the flight.

The pilot called the Fort Dodge Automated Flight Service Station at 0947 to file an IFR flight plan, and to check weather and Notices to Airmen (NOTAMS). When he filed the flight plan, the pilot indicated that the departure from IKV would be at 1015.

The flight scheduler reported that the pilot arrived about 1000 to 1015 and was not in the office for more than two minutes. She reported that he "grabbed the status book," walked straight to the airplane, and boarded.

A lineman who worked for the fixed base operator (FBO) reported that he was aware that the N27177 was scheduled for a flight. About 0930, he checked the fuel and oil, and added two quarts of oil to each engine. The lineman reported that a Beech King Air landed at IKV and needed to taxi to the FBO ramp to pick up a passenger. Using a tug, the lineman backed N27177 off a spot on the ramp to make room for the King Air. The lineman reported that he went to assist the King Air. The lineman reported that while he was assisting the King Air, the pilot and passenger boarded the N27177 and started the engines. The lineman reported that at the time, he was not aware that he had left the right engine oil dipstick on the wing of the airplane after he had serviced the engine with oil.

The lineman reported that the pilot taxied the airplane forward about 5 feet and abruptly stopped and shut down both engines. The pilot got out of the airplane. The lineman reported that he approached the pilot and asked what was wrong. The lineman reported that the pilot closed the oil flap door on the right engine, and said that the oil flap door had been left open. The pilot restarted the engines and taxied for takeoff from runway 18. The lineman did not observe the takeoff. He reported that the passenger was sitting in the right seat of the cockpit.

The transcript of radio communications between N27177 and Des Moines Departure Control indicated that at 1008, the pilot advised Departure Control that N27177 had departed IKV. The flight was cleared to fly direct to EMT and climb to 6,000 feet mean sea level (msl). About 1011, the pilot informed Departure Control that he wanted to return to IKV. Radar track data

indicated that N27177 turned right to a heading of 090 degrees magnetic at 3,400 feet msl. Departure Control instructed the pilot to fly heading 120 degrees. When questioned by Departure Control if N27177 was having any in-flight difficulties, the pilot responded, "Uh, we got an oil leak." At 1011:37, Departure Control advised the pilot that the airport was "at your twelve o'clock at five miles." At 1012:08, the pilot canceled his IFR flight plan. At 1012:16, Departure Control advised the pilot, "IFR cancellation received, squawk 1200, and change to Unicom frequency approved. Good day, sir." The pilot responded, "So long."

The flight scheduler reported that about five minutes after the pilot had boarded the airplane and departed, the pilot called on the Unicom radio frequency and reported that he was returning because he was having trouble with the right engine. The pilot reported that he was going to feather the right propeller, and that he requested that the lineman meet the airplane at the end of the runway with the tug. While the flight scheduler was talking to the pilot on Unicom, an employee brought an oil dipstick to her and informed her that they had found it on the ramp. The flight scheduler called the lineman and had him take the dipstick with him on the tug when he went to meet the airplane. The lineman drove the tug to the ramp of runways 04/22 to wait for the airplane. No other radio transmissions were heard from N27177 on either the Unicom frequency or departure control frequency.

The radar track data indicated that after he cancelled his IFR flight plan, the pilot turned to a heading of about 090 degrees and continued to descend. At 1013:26, the airplane's position was about 1.5 miles directly north of the airport at 1,800 feet msl, heading south at about 126 knots calibrated airspeed (CAS). The airplane continued to fly south directly to the airport. The radar track data indicated that instead of landing on runway 18, the airplane flew over the airport, paralleling runway 18. At 1014:21, the airplane's position was over the airport at an altitude of about 1,460 feet msl (550 feet above ground level), heading south at about 97 knots CAS. The airplane continued to fly south past the airport, entered a left turn, and turned back to the north.

The last radar return was recorded at 1016:21. The airplane's position was approximately 1.5 miles east of the approach end of runway 18 at an altitude of about 1,116 feet msl (344 feet agl), heading north at about 99 knots CAS. The impact site was located about 2.5 miles north of the last radar return.

The lineman reported that he was waiting for N27177 to return for about 1 to 2 minutes when he observed the airplane fly over the airport. He reported that the airplane was about 400 to 500 feet agl, flying south with the landing gear and flaps up. He reported that both engines were operating and that both propellers were turning at a synchronized speed. He reported that he saw the airplane fly a wide downwind pattern like it was going to land on runway 18 or runway 22, except that the airplane was at a low altitude. The lineman lost sight of the airplane and did not see the impact.

A witness, located about 1/4 mile from the accident site, reported that at 1017, he observed the airplane flying "really low." He reported, "The motor on the plane wasn't cutting out or sputtering. I thought it was going to pull up because there was no erratic movement, sound or smoke that would indicate a malfunction. I saw the airplane on a downward level flight but decreasing in altitude. Approximately due northeast of Ankeny Airfield it hit the ground and did a counterclockwise 180 degree flip ending facing the opposite direction that it came from. It stirred up dust, after the dust cleared there was no smoke, steam or electrical sparks and no sound."

Another witness reported, "I saw a plane headed north across N.E. 78th Ave. The plane lifted up over power lines then went across a field about 50 to 80 ft off ground." The landing gear were in the down position. He reported that the airplane turned left and then turned back to the right, impacting the ground in a nose down attitude.

PERSONNEL INFORMATION

The pilot was hired by Exec 1 Aviation in December 2004 as the company's Chief Pilot. According to company records, he held an airline transport certificate with single-engine and multiengine land airplane ratings and an airplane instrument rating. He held a second-class medical certificate. He had about 9,400 hours of total flight time of which 5,700 hours were in multiengine aircraft. He had about 500 hours in Piper PA-31 airplanes.

Exec 1 Aviation flight records indicated that the pilot did upgrade training in Piper PA-31's in August 2005. He flew two training flights for a total of 2.8 hours, and received a FAR Part 135 checkride in a PA-31 on September 2, 2005. Company records indicated that he flew 5.7 hours in a PA-31 on October 4, 2005, and 2.3 hours in a PA-31 on November 3, 2005.

The pilot-rated passenger held a commercial pilot certificate with single-engine land rating, a multiengine land airplane limited to center thrust rating, and an airplane instrument rating. He held a second-class medical certificate that was issued on May 30, 1980. The pilot reported his total flight time was 80 hours of civilian flying and 1,100 hours of military flying at his last medical examination in 1980.

AIRCRAFT INFORMATION

The twin-engine Piper PA-31-350, serial number 31-7752065, seated nine and had a maximum gross weight of 7,000 pounds. The engines were 350 horsepower Lycoming TIO-540-J2BD engines. The airplane's last 100-hours maintenance inspection was conducted on September 30, 2005. The airplane had flown about 67 hours since the last inspection and had accumulated a total airframe time of 8,337 hours.

A Federal Aviation Administration (FAA) airworthiness inspector examined the aircraft records and applicable airworthiness directives and found no anomalies.

METEOROLOGICAL INFORMATION

The 1015 observed weather at IKV was: winds 130 degrees at 9 knots, visibility 7 statute miles, clear sky, temperature 14 degrees Celsius (C), dew point 8 degrees C, altimeter 29.94 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted a harvested cornfield about 2.5 miles northeast of IKV. The wreckage path was about 45 feet in length from the initial impact point to the main wreckage on a magnetic heading of about 030 degrees. The right propeller separated from the right engine and was found in the area of ground depressions that marked the initial impact point. The airplane came to rest facing 210 degrees magnetic. The on-site inspection confirmed that the fuselage, empennage, wings, and all flight control surfaces were located at the accident site. The main landing gear were found in the down and locked position, and the airplane was resting on the main gear in an "exaggerated" nose up attitude.

The nose of the airplane was crushed aft and the cockpit was destroyed by impact forces. The instrument panel was crushed aft and broken, with most of the instruments dislodged from the

instrument panel. The landing gear switch was found in the down position. The flap switch was found in the up position. The throttle quadrant received impact damage. The left throttle lever was found in the full forward position, and the right lever was found one inch from the aft stop. Both left and right mixture levers were found in the lean position. The left propeller lever was found one inch from the forward stop, and the right propeller lever was found in the feathered position. The right rudder trim indicator was in a nose left position. The Hobbs meter read 754.2.

The right wing received impact damage and remained attached to the fuselage. The outboard section of the wing was crushed aft and bent upwards about 45-degrees. Fuel was leaking near the wing root. Both fuel caps were in place. The top inboard wing area including the top of the engine cowling was covered in oil. The right engine had separated from the engine mounts and nacelle, and was found lying upside down on the top of the right wing next to the cabin fuselage. No power control cables remained attached to the engine. The aileron remained attached to the wing, but the outboard section was damaged. The bell crank and bell crank stops were in place. The aileron trim displayed 2 threads, which was consistent with a neutral position. Aileron control continuity was established from the aileron to the mid-cabin area. The flap remained attached to the wing. The flap jackscrew displayed 16 threads, which was consistent with a 20-degree flap down position.

The left wing received impact damage and was found partially separated from the fuselage at the wing root. The outboard leading edge was crushed up and aft. Both fuel caps were in place. Fuel was leaking out of the fuel cap. The left engine had separated from the engine mounts and nacelle, and was found hanging from the wing by the power cables and engine component hardware. The left propeller remained attached to the engine. The aileron received impact damage. The bell crank and bell crank stops were in-place. Aileron control continuity was established from the bell crank to the separated cables at the wing root. Both ends of the separated cables had signatures consistent with tensile overload. The flap remained attached to the wing and was damaged at the outboard section. The flap jackscrew displayed 16 threads, which was consistent with a 20-degree flap down position.

The empennage exhibited no major visible damage. The elevator trim tab displayed 0 threads, which was consistent with a nose down trim position. The elevator trim cable was separated at the elevator trim drum. The cable separation was consistent with tensile overload. The rudder-trim drum displayed 13 threads, which was consistent with a full left nose trim position. Elevator and rudder control continuity was established to the aft cabin area.

The inspection of the right engine revealed that the right propeller had separated from the right engine flange. The oil filler tube was impact damaged. The oil dipstick was not located at the accident site. Approximately 1 to 2 quarts of oil were drained from the oil sump during the examination. The crankshaft was rotated and the engine exhibited gear and valve train continuity. All six cylinders produced compression. A borescope inspection of the cylinders revealed no mechanical damage.

The inspection of the left engine revealed that the left propeller remained attached to the right engine flange. The crankshaft was rotated and the engine exhibited gear and valve train continuity. All six cylinders produced compression. A borescope inspection of the cylinders revealed no mechanical damage.

The left and right propellers and their respective propeller governors were sent to the

manufacturer, Hartzell Propeller, Inc., for teardown.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies of the pilot and the pilot-rated passenger were performed at the Office of the Iowa State Medical Examiner in Des Moines, Iowa, on November 9, 2005. The FAA Civil Aeromedical Institute prepared a Forensic Toxicology Fatal Accident Report on the pilot, which indicated negative results for all drugs and substances tested.

TESTS AND RESEARCH

The inspection of the propellers was performed at the manufacturer's facility. The FAA provided oversight for the inspection.

The inspection of the left propeller assembly revealed frontal crushing of the left spinner dome with hydroforming of the dome over the propeller assembly and blade counterweights. There were two impact marks on the spinner dome caused by contact with blade counterweights. The counterweights were at a low blade angle position when the marks were made.

The left propeller pitch change rod was fractured on both sides of the fork. The aft portion of the pitch change rod had an impact mark from contact with the bore in the rear hub half. The mark occurred with a piston pin position that was consistent with a low blade angle.

The inspection of the left propeller blades revealed that all three blades exhibited rotational scoring, all three pitch change knobs were fractured, and all three blade counterweights were intact. There was no "significant" twisting found in the blades. The blade marked "LA" had its blade tip curled forward.

The inspection of the right propeller assembly revealed frontal crushing of the right spinner dome with hydroforming of the dome over the propeller assembly and blade counterweights. There were impact marks on the spinner dome caused by contact with all three of the blade counterweights. The counterweights were at a low blade angle position when the marks were made.

The inspection of the right propeller blades revealed that all three blades exhibited a "slight" twist toward low pitch, all three pitch change knobs were intact, and all three blade counterweights were intact. The inspection of the right propeller blades revealed that the blade marked "RA" exhibited no damage. The blade marked "RB" was bent aft about 30 degrees at the 1/3 radius. It exhibited slight rotational scoring in the paint on the chamber side. The blade marked "RC" was bent aft about 30 degrees at the 1/3 radius.

The inspection of the propeller governors revealed that both governors' pumping capacity met specifications during bench testing.

ADDITIONAL INFORMATION

The FAA, the New Piper Aircraft Company, and Textron-Lycoming were parties to the investigation.

The aircraft wreckage was released to Exec 1 Aviation and Wentworth Aircraft, Inc.

Pilot Information

Certificate:	Airline Transport	**Age:**	62, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	9400 hours (Total, all aircraft), 460 hours (Total, this make and model), 8760 hours (Pilot In Command, all aircraft), 48 hours (Last 90 days, all aircraft), 29 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N27177
Model/Series:	PA-31-350	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	31-7752065
Landing Gear Type:	Retractable - Tricycle	**Seats:**	9
Date/Type of Last Inspection:	09/01/2005, 100 Hour	**Certified Max Gross Wt.:**	7000 lbs
Time Since Last Inspection:	67 Hours	**Engines:**	2 Reciprocating
Airframe Total Time:	8336 Hours at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	TIO-540-J2BD
Registered Owner:	Exec 1 Aviation	**Rated Power:**	350 hp
Operator:	Exec 1 Aviation	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	IKV, 910 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	1015 CDT	**Direction from Accident Site:**	225°
Lowest Cloud Condition:	Clear	**Visibility**	7 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	130°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.94 inches Hg	**Temperature/Dew Point:**	14°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ankeny, IA (IKV)	**Type of Flight Plan Filed:**	IFR
Destination:	Emmetsburg, IA (EGQ)	**Type of Clearance:**	None
Departure Time:	1007 CST	**Type of Airspace:**	

Airport Information

Airport:	Ankeny Regional Airport (IKV)	**Runway Surface Type:**	
Airport Elevation:	910 ft	**Runway Surface Condition:**	
Runway Used:	NA	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	41.726667, -93.535000

Administrative Information

Investigator In Charge (IIC):	Jim Silliman	**Report Date:**	10/31/2006
Additional Participating Persons:	Terry Warren; FAA-Des Moines FSDO; Des Moines, IA Robert Martellotti; The New Piper Aircraft Company; Vero Beach, FL Edward Rogalski; Textron Lycoming; Belleview, FL		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		