Aviation Investigation Final Report

Location:	Kaiser/Lake Oza, Missouri	**Accident Number:**	CHI02LA186
Date & Time:	July 8, 2002, 21:30 Local	**Registration:**	N175HL
Aircraft:	Cessna 175	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	5 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During a forced landing into a hayfield, the aircraft was substantially damaged when it impacted a perimeter tree line. Shortly after takeoff, the airplane's performance was "somewhat sluggish and was slow to accelerate up to 100 mph", according to the pilot. He reported that approximately five miles from the airport at 400 ft agl, the engine suffered a "catastrophic loss of power." He noted that returning to the airport was not possible due to the developing descent rate and that options for a forced landing site were limited due to the terrain. A small hay field was selected, however, he was unable to stop prior to the tree line at the edge of the field. A post-accident engine examination by the FAA inspector on-scene noted that the left magneto drive gear had malfuntioned, producing an erratic spark distribution and resulting in a significant loss of engine performance. The pilot reported having engine problems the day before the accident flight. He returned to the departure airport and consulted a mechanic. A loose spark plug lead was secured and a non-firing spark plug was replaced. The mechanic's statement noted that the airplane still was not developing rated static RPM's and was not within tolerances on the magneto checks. He determined that the left magneto needed to be replaced or repaired. The pilot's statement reported that the engine performance was within specifications, and that the mechanic indicated replacement of the left magneto was optional. No logbook entry was made for the work done. In addition, the accident flight was conducted with a total of five occupants on-board: two adults and three children. This exceeded the number of approved seats/seat belts installed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to conduct the flight with a known deficiency in the aircraft, a failure by the pilot to execute a precautionary landing due to "sluggish" performance during takeoff, the loss

of engine power due to the malfunction of the left magneto, and the lack of suitable terrain for a forced landing. Contributing factors were the low ambient light due to the time of day (night), and the tree line at the edge of the field.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF
Phase of Operation: CLIMB - TO CRUISE

Findings
1. (C) OPERATION WITH KNOWN DEFICIENCIES IN EQUIPMENT - INTENTIONAL - PILOT IN COMMAND
2. (C) PRECAUTIONARY LANDING - NOT PERFORMED - PILOT IN COMMAND
3. (C) IGNITION SYSTEM,MAGNETO - MALFUNCTION
4. MISC EQPT/FURNISHINGS,SEAT BELT - NOT INSTALLED

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

Findings
5. (C) UNSUITABLE TERRAIN OR TAKEOFF/LANDING/TAXI AREA - ENCOUNTERED - PILOT IN COMMAND
6. (F) LIGHT CONDITION - DARK NIGHT

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Occurrence #4: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: EMERGENCY LANDING

Findings
7. (F) OBJECT - TREE(S)

Factual Information

On July 8, 2002, approximately 2130 central daylight time, a Cessna 175, N175HL, piloted by a private pilot, was substantially damaged during a forced landing following a loss of engine power. The airplane was on climbout, approximately five miles from the airport at 400 feet agl, when the loss of engine power occurred. The flight departed runway 3 (6,497 feet x 100 feet, asphalt) at the Lee C. Fine Memorial Airport (AIZ), Osage Beach, Missouri. Visual meteorological conditions prevailed. The flight was being conducted under the provisions of 14 CFR Part 91 and was originating at the time of the accident. The intended destination was the Greater Peoria Regional Airport (PIA), Peoria, Illinois. The pilot and passengers did not report any injuries.

In his written statement, the pilot noted that the airplane's performance shortly after takeoff was "somewhat sluggish and was slow to accelerate up to 100 mph." During the climb, "the plane suffered a catastrophic loss of power." The pilot stated that sufficient power to maintain level flight was not available and that returning to the airport was not possible due to the developing descent rate. The pilot reported that few options existed as forced landing sites. He selected a small hayfield, but was unable to stop prior to the tree line at the edge of the field.

The pilot reported that the run-up prior to the accident flight was completed with no indication of a problem. However, he stated that the evening before he experienced problems shortly after takeoff and returned to the airport where he landed without incident. He contacted a mechanic to look at the airplane. The pilot stated that the mechanic found a "bad spark plug" and an unattached spark plug wire. These items were corrected and the engine was run. The pilot's report stated that we "checked the mag[neto]s and everything appeared to be in good working order and within tolerances." He also noted that a subsequent review of the engine logbooks revealed no entry to indicate that the left magneto had been replaced or overhauled. The pilot reported an entry which indicated the right magneto was overhauled in September 1989. He went on to note that "[the mechanic] stated that replacing the left magneto was strictly 'optional' as it appeared to be operating within tolerances at this time."

In a written statement submitted after the accident, the mechanic noted that the initial examination revealed a non-firing spark plug and an unattached spark plug lead. He reported that these items were corrected and the engine was run. During the engine run, the mechanic noted that the indicated static RPM readings were 200~400 below that specified in the POH, and that RPM readings during several magneto checks were 175~300 below the allowable of 125 rpm's maximum specified in the POH. He went on to state that "I told [the pilot] that the [left] mag[neto] should be replaced or at least repaired."

A post-accident engine examination by the FAA revealed that the left magneto distributor drive gear had malfunctioned and the magneto exhibited an erratic spark distribution.

The Cessna 175 airplane involved in the accident had accumulated 1,665 hours total time. An annual inspection was completed on June 25, 2002, and 5 hours had been flown since then. The Continental GO-300 series engine installed, likewise, had accumulated 1,665 hours total time. The time since overhaul was reported as 340 hours.

On the evening of the accident, sunset was at 2036 cdt, with civil twilight ending at 2107 cdt. The moon set at 1921 cdt. The pilot reported conditions at the scene as clear skies and light, north winds at 5 knots.

At the time of the accident there were five occupants on-board the aircraft. A review of the FAA Type Certificate Data Sheet (No.: 3A17) for the Cessna 175 indicates an approved seating capacity of four persons. 14 CFR 91.107(a)(3) states that "each person on board a U.S.-registered civil aircraft ... must occupy an approved seat or berth with a safety belt and, if installed, shoulder harness, properly secured about him or her during movement on the surface, takeoff and landing.

Pilot Information

Certificate:	Private	**Age:**	49,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 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	February 14, 2002
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 10, 2000
Flight Time:	199 hours (Total, all aircraft), 6 hours (Total, this make and model), 169 hours (Pilot In Command, all aircraft), 10 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N175HL
Model/Series:	175	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	55002
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 25, 2002 Annual	**Certified Max Gross Wt.:**	2350 lbs
Time Since Last Inspection:	5 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1665 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	GO-300 Series
Registered Owner:	On file	**Rated Power:**	175 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	AIZ,869 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	21:35 Local	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.11 inches Hg	**Temperature/Dew Point:**	26°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Kaiser/Lake Oza, MO (AIZ)	**Type of Flight Plan Filed:**	None
Destination:	Peoria, IL (PIA)	**Type of Clearance:**	None
Departure Time:	21:15 UTC	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	4 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	5 None	**Latitude, Longitude:**	38.096111,-92.549446

Administrative Information

Investigator In Charge (IIC):	SORENSEN, TIME
Additional Participating Persons:	James Wesley; FAA – Kansas City FSDO; Kansas City, MO
Original Publish Date:	April 15, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55190