



National Transportation Safety Board Aviation Accident Factual Report

Location:	Gettysburg, PA	Accident Number:	ERA15LA363
Date & Time:	09/19/2015, 1043 EDT	Registration:	N3647S
Aircraft:	CESSNA 172E	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	2 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

On September 19, 2015, at 1043 eastern daylight time, a privately owned and operated Cessna 172E, N3647S, was substantially damaged during a forced landing to a soybean field after a total loss of engine power near Gettysburg, Pennsylvania. The private pilot and pilot-rated passenger received serious injuries. Visual meteorological conditions prevailed and no flight plan was filed for the local personal flight that departed from Waltz Field (34PA), Gettysburg, Pennsylvania about 1015. The airplane was being operated under the provisions of Title 14 Code of Federal Regulations Part 91.

The pilot-rated passenger stated that prior to departure, during the engine run-up, the engine ran "a little rough" when operated on one of the two magnetos. The pilot continued the run up until the engine operated smoothly on the left, right, and both magnetos. He recalled that the engine operated "remarkably smooth" for takeoff, climb and while performing various maneuvers. After descending from 3,000 feet to about 1,500 feet above mean sea level, the engine started to "shake, rumble, spit, and sputter and then just quit." The passenger further recalled that the pilot did not reduce engine power from its previous setting of around 2,400 rpm during the descent, nor did he apply carburetor heat. After the engine lost power, the pilot attempted to land in a nearby grass field, however the approach was too fast. He overflew the grass field, then touched down in an adjacent soybean field, the airplane bounced, veered left, and collided with the tree line at the edge of the field.

According to Federal Aviation Administration (FAA) records, the pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent FAA third-class medical certificate had expired, it was issued on December 29, 2010, at which time he reported a total of 2,096 hours of flight experience.

The four-seat, single-engine, high-wing airplane was manufactured in 1963, and was equipped with a Continental O-300D, 145-horsepower reciprocating engine. The maintenance logbooks were not recovered. FAA airworthiness records showed that the airplane had been modified to operate with automotive gasoline in accordance with a supplemental type certificate. According to a mechanic, an annual inspection of the airplane was completed in July 2013, after which the airplane had accrued about 1 hour of flight prior to the next annual inspection, which was

completed by him on September 11, 2015. During the interval between the two inspections, automotive fuel remained in the fuel tanks. Maintenance documents provided by the mechanic revealed that the carburetor had been replaced, seals in the fuel selector valve and gascolator were replaced, the automotive fuel was drained and 15 gallons of 100 low-lead aviation fuel was added to the fuel tanks, just prior to the September 2015 annual inspection. Afterwards, the engine operated satisfactorily during ground tests. The accident flight was the first flight after the maintenance and inspection.

Examination of the airplane revealed that the left wing was partially separated from the fuselage, rotated about 45 degrees aft, and exhibited leading edge crush damage. The right wing remained attached, exhibited leading edge crush damage, and the right aileron was separated from the wing. The empennage was partially separated from the fuselage near the aft bulkhead of the cargo compartment. Flight control cable continuity was confirmed for pitch and yaw from the cockpit controls to the respective control surfaces, while the aileron control cables exhibited fractures in each wing consistent with tension overload.

The left fuel tank was breached, and about 2 gallons of fuel were drained from it during recovery operations. An unknown amount of fuel had leaked from the right wing after the accident. The gascolator and carburetor were full of a yellowish-amber fluid similar in color and odor as automotive fuel. The fuel inlet screen was unobstructed, and no water was present. Air pressure was applied to the gascolator outlet and fluid was observed flowing through the fractured fuel lines at the door pillars near the wing attach points. The carburetor needle valve and seat were clean with no debris found. When manually operated, fluid was observed exiting out of the carburetor accelerator pump. The carburetor main fuel nozzle was absent of debris. The fluid observed throughout the fuel system was yellowish-amber in color with an odor consistent with automotive fuel.

One of the propeller blades was bent aft at its tip. Neither blade exhibited a pattern of chordwise scratching or leading edge damage. The propeller was rotated by hand and thumb suction and compression was observed on all cylinders. Continuity of the crankshaft was confirmed to the rear accessory pad. The top spark plugs were removed and appeared grey to slightly black in color with normal wear when checked against the Champion Check-A-Plug chart. Both magnetos produced spark on all towers when rotated by hand. The air inlet box was clean and free of obstructions. The throttle, mixture, and carburetor heat controls were securely attached to the engine and moved freely. The oil quantity dipstick indicated 6 quarts.

A weather observation recorded at Fountain Dale Heliport (RYT), Fountain Dale, Pennsylvania, at 1053 included: temperature 23 degrees C (73 F), dew point 18 degrees C (64 F), and an altimeter setting of 29.95 inches of mercury.

According to an FAA Special Airworthiness Information Bulletin, these weather conditions are conducive to serious carburetor icing at glide power settings. FAA Advisory Circular (AC) 91-33A, Use of Alternate Grades of Aviation for Grade 80/87, and Use of Automotive Gasoline, provided operational information regarding the use of automotive fuels in aircraft. According to the AC, "Long-term fuel storage of automotive gasoline in aircraft fuel tanks should be avoided. Although automotive gasolines have lower maximum existent gum specification requirements than aviation gasoline, either fuel can form undesirable gum deposits over long-term storage under particularly severe conditions, such as in barrels and at

high temperature. Gum deposits thus formed could result in engine malfunctions." The AC further stated, "FAA Technical Center testing indicates that carburetor icing will occur in less time and at higher ambient temperatures with automotive gasoline than with aviation gasoline. Therefore, pilots using automotive gasoline should be familiar with the induction system icing prevention procedures of the FAA Advisory Circular AC 20-113 and be prepared to use these procedures at higher ambient temperatures and lower humidities than when using aviation gasolines."

Pilot Information

Certificate:	Private	Age:	85, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Unknown
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 With Waivers/Limitations	Last FAA Medical Exam:	12/29/2010
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	2096 hours (Total, all aircraft)		

Pilot-Rated Passenger Information

Certificate:		Age:	64, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	Lap Only
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):		Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	04/27/2012
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	438 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	Registration:	N3647S
Model/Series:	172E E	Aircraft Category:	Airplane
Year of Manufacture:	1963	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	17250847
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	09/11/2013, Annual	Certified Max Gross Wt.:	
Time Since Last Inspection:	1 Hours	Engines:	1 Reciprocating
Airframe Total Time:	2181 Hours at time of accident	Engine Manufacturer:	CONT MOTOR
ELT:	C91 installed	Engine Model/Series:	O-300-D6
Registered Owner:	On file	Rated Power:	145 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	RYT, 902 ft msl	Distance from Accident Site:	9 Nautical Miles
Observation Time:	1053 EDT	Direction from Accident Site:	236°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	10°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	29.95 inches Hg	Temperature/Dew Point:	23°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	GETTYSBURG, PA (34PA)	Type of Flight Plan Filed:	None
Destination:	GETTYSBURG, PA (34PA)	Type of Clearance:	None
Departure Time:		Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Serious	Latitude, Longitude:	39.813056, -77.277222 (est)

Administrative Information

Investigator In Charge (IIC):	Douglass P Brazy
Additional Participating Persons:	Gary Martin; FAA/FSDO; Harrisburg, PA
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=91997