National Transportation Safety Board
Aviation Accident Final Report

Location:	Puyallup, WA	**Accident Number:**	WPR09LA223
Date & Time:	05/01/2009, 1518 PDT	**Registration:**	N382CH
Aircraft:	CESSNA 182Q	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot reported that the accident flight was the first flight following maintenance that replaced the fuel sending units, which required draining the fuel tanks. The pilot stated that maintenance personnel added 20 gallons of fuel to each main tank following the work. He did not physically check the fuel level in the tanks, but noted that both fuel gages indicated the same amount of fuel prior to flight. He reported that the engine lost power about 500 feet above ground level on takeoff, and he made an off airport landing that damaged the wings, airframe, and rudder. A Federal Aviation Administration (FAA) inspector examined the airplane the night of the accident, and noted that no fuel was in the left main tank, but maintenance personnel drained about 20 gallons from the right tank. On a follow-up exam, investigators added 5 gallons of fuel to the left wing tank. The engine started immediately without hesitation. It accelerated smoothly to 1,800 rpm, and a magneto check revealed no anomalies. The engine was decelerated to idle rpm; the engine ran smoothly, and shutdown was unremarkable. The airplane had a recording engine data management unit installed. Data indicated that fuel flow dropped to 0 gallons per hour 6 seconds prior to a loss of rpm.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power due to fuel starvation as a result of the pilot's failure to verify the fuel levels in the tanks, and, his failure to select the proper fuel tank.

Findings

Aircraft	Fuel - Fluid level (Cause) Fuel selector/shutoff valve - Incorrect use/operation (Cause)
Personnel issues	Use of equip/system - Pilot (Cause)
Environmental issues	Residence/building - Not specified

Factual Information

On May 1, 2009, about 1518 Pacific daylight time, a Cessna 182Q, N382CH, collided with objects during an off airport forced landing following a loss of engine power at Puyallup, Washington. The owner/pilot was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The certificated airline transport pilot sustained minor injuries; the airplane sustained substantial damage to the airframe, rudder, and wings from impact forces. The personal cross-country flight was departing with an intended destination of Bremerton, Washington. Visual meteorological conditions prevailed, and no flight plan had been filed.

The pilot stated that this was the first flight following completion of an annual inspection, which included replacement of the fuel sending units. This required draining the fuel tanks. Maintenance personnel indicated that they had fueled the airplane with 20 gallons in each tank, and completed a 10-minute ground run of the engine without any difficulties noted prior to the accident flight.

The pilot reported that he experienced no anomalies during start, taxi, run-up, or the takeoff. He stated that the engine lost power about 500 feet above ground level (agl) over the departure end of runway 34. The pilot started a steep 180-degree turn, and intended to land on the parallel taxiway. The airplane was short takeoff and landing (STOL) equipped, and he had practiced this maneuver.

Local law enforcement was conducting an exercise on the field, and they responded to the perceived emergency by driving down the taxiway on which the pilot intended to land. The pilot stated that he looked for an alternate landing site, and noted that the area between the parallel taxiway and runway was soft due to recent rainfall. While in the turn about 50 feet above ground level (agl), he saw a heavy fence, which he thought was too substantial to hit. He was also over a port-a-potty maintenance and storage facility, and turned to the right to look for a softer target. The pilot stated that he chose to fly the airplane into a 50-foot square block of the port-a-potty units, which had a pile of wood chips behind them.

The pilot aimed to contact the units about 3-5 feet above the seat and tank area. He was happy with the results as he experienced a 2-g deceleration, and the airplane slowed from an estimated 60 knots to 30 knots. As the airplane settled, it nosed over, and came to rest softly in the wood chip pile.

A Federal Aviation Administration (FAA) inspector reported that the airplane had already been moved to a hangar by the time he examined it on the night of the accident. The inspector noted that maintenance personnel drained no fuel from the left tank and 20 gallons from the right tank. The left wing was intact; the right wing sustained damage and drooped. The fuel selector was in the OFF position.

On May 11, maintenance personnel added 5 gallons of fuel to the left wing tank. The engine started immediately, and was run until all temperatures and pressures were within normal operating limits. The engine was then run up to 1,800 revolutions per minute (rpm); it accelerated smoothly without hesitation. A magneto check was performed with a 50 rpm drop on both magnetos. The engine was then decelerated to idle rpm; the engine ran smoothly, and shutdown was unremarkable.

The inspector interviewed the pilot, who indicated that he did not visually check inside the fuel

tanks prior to flight. The pilot stated that the fuel gauges indicated an equal amount in each tank.

J.P. Instruments Unit

The airplane had a J.P. Instruments EDM 700/800 engine data management unit installed. Among the engine parameters recorded by this unit were the fuel flow in gallons per hour (gph), manifold pressure, engine rpm, exhaust gas temperature (EGT), and cylinder head temperature (CHT) for all six cylinders. It also recorded the parameters in relation to time.

A plot of the data revealed an initial rpm of 1,400 and a corresponding fuel flow of 4 gph. About 32 seconds later, the fuel flow increased linearly over 12 seconds to 28 gph, and the rpm increased to 2,600. These values remained constant for 18 seconds. The fuel then decreased linearly to 0 gph over 12 seconds. Six seconds after the fuel flow began to decrease, the rpm decreased linearly over 6 seconds to 1,400 rpm. It then gradually declined to 700 rpm over the next 14 seconds where the data ended. The EGT dropped rapidly as the rpm decreased.

History of Flight

Takeoff	Fuel starvation Loss of engine power (total) (Defining event)
Landing	Off-field or emergency landing
Landing-flare/touchdown	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Airline Transport; Commercial; Flight Engineer	**Age:**	67, 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:**	No
Medical Certification:	Class 3 Without Waivers/Limitations	**Last Medical Exam:**	10/31/2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	05/15/2008
Flight Time:	20000 hours (Total, all aircraft), 100 hours (Total, this make and model), 1 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	CESSNA	**Registration:**	N382CH
Model/Series:	182Q	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	18267390
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	04/18/2009, Annual	**Certified Max Gross Wt.:**	2950 lbs
Time Since Last Inspection:	0 Hours	**Engines:**	1 Reciprocating
Airframe Total Time:	3000 Hours	**Engine Manufacturer:**	Teledyne Continental Motors
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-550D
Registered Owner:	CLIFFORD G HOWELL	**Rated Power:**	300 hp
Operator:	CLIFFORD G HOWELL	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KPLU, 538 ft msl	**Observation Time:**	1510 PDT
Distance from Accident Site:	1 Nautical Miles	**Condition of Light:**	Day
Direction from Accident Site:	340°	**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Clear	**Temperature/Dew Point:**	22°C / 0°C
Lowest Ceiling:	None	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	4 knots, 260°	**Visibility (RVR):**	
Altimeter Setting:	29.91 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Puyallup, WA (PLU)	**Type of Flight Plan Filed:**	None
Destination:	Bremerton, WA (PWT)	**Type of Clearance:**	None
Departure Time:	1518 PDT	**Type of Airspace:**	

Airport Information

Airport:	Pierce County (PLU)	**Runway Surface Type:**	
Airport Elevation:	538 ft	**Runway Surface Condition:**	
Runway Used:	N/A	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced Landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor		

Administrative Information

Investigator In Charge (IIC):	Howard D Plagens	**Adopted Date:**	05/11/2010
Additional Participating Persons:	Kris Kern; FAA FSDO; Seattle, WA		
Publish Date:	05/10/2010		
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/.		