



Aviation Investigation Final Report

Location:	Rawlins, Wyoming	Accident Number:	WPR10LA376
Date & Time:	July 31, 2010, 09:10 Local	Registration:	N35296
Aircraft:	Cessna 177	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that, prior to initiating the takeoff roll, he did not lean the fuel mixture. The airplane initially accelerated slowly, which the pilot expected at the high density altitude airport. About 50 feet above the ground, the pilot observed the engine rpm decreased from 2,700 to 2,500 rpm; the airplane was also losing altitude. The pilot elected to reduce the power and land on the runway overrun area; during the landing, the airplane struck a rock with the left main landing gear, which resulted in substantial damage to the elevator. A postaccident examination revealed that the spark plugs were carbon fouled, indicating that the engine was operating too rich. During the first engine run-up, the engine ran rough. After the spark plugs were cleaned, the engine ran normally with no anomalies noted. The airplane's takeoff checklist notes, MIXTURE -- LEAN for maximum power at airports above 3,000 feet in elevation. The elevation of the airport was 6,813 feet. The density altitude at the time of the accident was 8,895 feet.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate preflight planning, failure to properly use the takeoff checklist, and failure to lean the fuel mixture, which resulted in the airplane's inability to attain sufficient airspeed due to the rich fuel mixture.

Findings Personnel issues Use of checklist - Pilot Environmental issues High density altitude - Contributed to outcome Aircraft Fuel controlling system - Incorrect use/operation

Factual Information

History of Flight	
Initial climb	Loss of engine power (partial) (Defining event)
Emergency descent	Off-field or emergency landing

On July 31, 2010, about 0910 mountain daylight time, a Cessna 177B airplane, N35296, sustained substantial damage following a partial loss of engine power during initial climb and subsequent forced landing at the Rawlins Municipal Airport (RWL), Rawlins, Wyoming. The certificated airline transport pilot and his sole passenger were not injured. Visual meteorological conditions prevailed for the planned cross-country flight, which was being operated in accordance with 14 Code of Federal Regulations Part 91, and a flight plan was not filed. The flight was originating at the time of the accident, with Scottsbluff, Nebraska the planned destination.

In a statement submitted to the National Transportation Safety Board investigator-in-charge (IIC), the pilot reported that prior to his departure he noticed that a sign in the fixed based operator's office indicated that runway 04 had an up hill gradient and that there was rising terrain at the end of the runway. The pilot stated that prior to taxiing for takeoff he noticed that the windsock pointed in a direction that favored runway 04. The pilot reported that at the end of runway 04 he performed his run up and preflight checks and that everything seemed to be normal; the pilot's statement also indicated that he failed to lean the fuel mixture prior to takeoff. The pilot further reported that he then taxied onto runway 04 and added full power for takeoff; a check of the engine revolutions per minute (RPM) and manifold pressure (Hg) indicated 2,700 RPM and 23 Hg respectively, with engine oil temperature and oil pressure readings both normal. The pilot revealed that the airplane accelerated slowly, which he said was to be expected at an altitude of 6,800 feel [mean sea level] (msl). The pilot stated that he rotated at normal speed and started to climb, and at about 50 feet above ground level, "...the aircraft vibration and sound changed." The pilot reported that he noticed that the RPM had dropped to 2,500 and that the airplane was losing altitude. The pilot further reported that at this point he "cut the power" and landed on the runway overrun. The pilot added that the airplane subsequently struck a rock with its left main [landing] gear before coming to a stop. The airplane sustained substantial damage to its elevator.

At the request of the IIC, a certified Federal Aviation Administration (FAA) airframe and powerplant mechanic conducted a post accident examination of the airplane's engine. The mechanic reported that a visual examination of the spark plugs revealed that cylinder #4 top and bottom spark plugs were carbon fouled out and that all of the engine's spark plugs were observed to have carbon fouling. The mechanic further reported that all cylinders were borescoped with no anomalies noted. Additionally, the mechanic verified that both the intake and exhaust rocker arms were checked for movement, all of which checked normal. The mechanic stated that while rotating the engine's crankshaft, spark was verified at all ignition harness leads, the carburetor's accelerator pump expelled fuel when actuated, and that the engine timing checked normal. The mechanic added that during the first run up of the engine it ran rough, but after the cylinder's #4 spark plugs were cleaned, the engine ran normally at all power settings. In part, the mechanic concluded in his report that "...the engine ran too rich, [which] is why [the] engine would not operate properly..."

At 0853, the weather reporting facility located at RWL reported wind variable at 3 knots, visibility 10 miles, temperature 21 degrees Celsius, dew point 10 degrees Celsius, and an altimeter setting of 30.21 inches of Mercury. The density altitude at the time of the accident was calculated to have been 8,895 feet.

The Cessna 177B BEFORE TAKE-OFF checklist, item 6 states: Mixture – RICH (below 3000 ft.). Additionally, under the TAKE-OFF checklist, under MAXIMUM PERFORMANCE TAKE-OFF, item 5 states: Mixture -- LEAN for maximum power (above 3000 feet elevation). The airport elevation was 6,813 feet msl.

Pilot Information

Certificate:	Airline transport	Age:	63,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Without waivers/limitations	Last FAA Medical Exam:	July 21, 2010
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	July 22, 2010
Flight Time:	6648 hours (Total, all aircraft), 907 hours (Total, this make and model), 25 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N35296
Model/Series:	177 B	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	17702312
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	September 2, 2009 Annual	Certified Max Gross Wt.:	2500 lbs
Time Since Last Inspection:	67 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	2735 Hrs at time of accident	Engine Manufacturer:	LYCOMING
ELT:	Not installed	Engine Model/Series:	O-360
Registered Owner:	On file	Rated Power:	180 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	RWL,6813 ft msl	Distance from Accident Site:	
Observation Time:	08:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	3 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.2 inches Hg	Temperature/Dew Point:	21°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitat	tion	
Departure Point:	Rawlins, WY (RWL)	Type of Flight Plan Filed:	None
Destination:	Scottsbluff, NE (BFF)	Type of Clearance:	None
Departure Time:	09:10 Local	Type of Airspace:	

Airport Information

Airport:	Rawlins Municipal Airport RWL	Runway Surface Type:	Asphalt
Airport Elevation:	6813 ft msl	Runway Surface Condition:	Dry
Runway Used:	04	IFR Approach:	None
Runway Length/Width:	7008 ft / 100 ft	VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	41.805392,-107.19974(est)

Administrative Information

Investigator In Charge (IIC):	Little, Thomas
Additional Participating Persons:	Michael Maglione; Federal Aviation Administration; Casper, WY
Original Publish Date:	December 27, 2011
Last Revision Date:	
Investigation Class:	<u>Class</u>
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=76805

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