Aviation Investigation Final Report

Location:	Jean, Nevada	**Accident Number:**	WPR11LA263
Date & Time:	June 18, 2011, 08:00 Local	**Registration:**	N6991Q
Aircraft:	Beech B23	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

According to the student pilot, while returning to his home base, he established the airplane in a slow flight configuration. About five minutes later, while he was still performing the slow flight maneuver, the engine began to run rough. The pilot then noticed that the left fuel gauge was indicating less than 1/4 full, and the right tank gauge was indicating over 1/2 full; the engine then lost power. Because he was about 500 feet above the ground when the engine lost power, he did not attempt to restart the engine, nor did he switch the fuel selector to the right tank. The pilot attempted to stretch the glide to the lakebed, but he was unable to do so, and the airplane touched down in an area of soft sand and sagebrush. A postaccident examination of the airplane determined that the left fuel tank was empty, and an undetermined amount of fuel was in the right tank. The pilot miscalculated the fuel burn and relied on his inaccurate fuel gauges to determine the pretakeoff fuel quantity.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The student pilot’s improper in-flight fuel management when he did not switch to the fullest fuel tank when the engine began to lose power, which resulted in fuel starvation and the complete loss of engine power during maneuvering flight. Contributing to the accident was the pilot's lack of knowledge of the engine's fuel consumption rate and the inaccurate fuel flow calculations that led to an inaccurate fuel quantity prior to takeoff.

Findings

Aircraft	Fuel selector/shutoff valve - Not used/operated
Personnel issues	Lack of action - Student/instructed pilot
Personnel issues	Fuel planning - Student/instructed pilot
Personnel issues	Knowledge of equipment - Student/instructed pilot
Environmental issues	(general) - Contributed to outcome

Factual Information

History of Flight

Prior to flight	Aircraft inspection event
Maneuvering	Fuel starvation
Maneuvering	Loss of engine power (total) (Defining event)
Emergency descent	Collision with terr/obj (non-CFIT)

On June 18, 2011, about 0800 Pacific daylight time, a Beechcraft B23, N6991Q, impacted the terrain during a forced landing about one mile east of Jean, Nevada. The student pilot, who was the sole occupant, was not injured, but the airplane, which was owned by Desert Oasis Veterinary Enterprises LLC, and operated by the student pilot, sustained substantial damage. The 14 Code of Federal Regulations Part 91 local area solo instructional/proficiency flight, which departed Henderson Executive Airport, Las Vegas, Nevada, about 75 minutes prior to the accident, was being operated in visual meteorological conditions. No flight plan had been filed.

According to the pilot, he intended to fly for about 90 minutes, during which time he planned on performing a few touch-and-go landings, slow flight, maneuvering slow flight, turns around a point, and a series of S-turns. Prior to departing Henderson Executive Airport, the pilot estimated that he had 30 gallons of fuel onboard. The pilot initially elected to burn fuel out of the right tank, which appeared to have, "…slightly more fuel than the left." After departing Henderson Executive, the pilot flew to Jean Airport, which was about 18 miles to the south, where he entered the traffic pattern and completed two touch-and-go landings. Then, due to the fact that the traffic pattern at Jean was getting busy, the pilot decided to go about 5 miles east of Jean Airport, where, after switching to the left fuel tank, he practiced S-turns and slow flight. He then decided to move about 10 miles further south, near Primm, Nevada, where he practiced turns around a point over a racetrack located on a dry lakebed. The pilot then decided to head back to Henderson Executive, which was about 35 miles to his north. As he began to head north at 4,200 feet mean sea level (msl), the pilot once again established a slow flight configuration and airspeed, so as to continue practicing his slow flight while en route back to Henderson.

After the pilot had flown about 5 miles of slow flight, which brought him to a point about 6 miles south of Jean Airport, the airplane's engine suddenly began running very rough. This was accompanied by a noticeable loss of power and an associated loss of altitude. Because he was only about 1,500 feet above ground level (agl) when the loss of power began, the pilot decided to divert into Jean Airport. As he turned toward the airport, he turned on the fuel pump, added full throttle (his mixture was already in the full rich position), and checked to make sure the carburetor heat was fully on. As he maneuvered toward the airport, he checked the two fuel gauges. Reportedly, the left gauge read a little less than ¼ full, and the right gauge read just over ½ full. Because the right tank was indicating higher than the left, the pilot decided to

switch to the right tank, but just as he started to do so, the engine lost all power.

Because he was at 500 feet agl when the engine quit producing power, the pilot ultimately elected not to switch to the right tank, but instead focused on heading toward a nearby dry lakebed, where he hoped to execute an engine-out forced landing. Although he attempted to stretch the plane's glide to the lakebed, he was unable to do so, and therefore the airplane touched down in soft sand and scrub brush about 200 feet short of the lakebed. After coming in contact with the scrub brush, all three landing gear were torn off, and the airplane's wings sustained substantial damage as they contacted the scrub brush and the terrain.

An FAA Inspector from the Las Vegas Flight Standards District Office responded to the accident, and after inspecting the airplane and talking to the pilot, he reported his findings to the NTSB Investigator-In-charge. According to the inspector, although there was an undetermined amount of fuel in the right fuel tank, the left fuel tank was totally empty. He confirmed that the fuel selector was still on the left tank, and also inspected the airplane further to ensure that there were no stains or other indications of an in-flight or postaccident fuel leak. He also said that the pilot had not used a tank quantity measuring device to determine the pre-takeoff fuel quantity, but instead had based his fuel estimate upon a visual inspection of the fuel tanks, and on the fuel gauge readings in the 43 year old low wing airplane.

A review of the Form 6120.1 (Pilot/Operator Aircraft Accident/Incident Report) that the pilot submitted to the NTSB, revealed that he had estimated the airplane's fuel burn would be, "…approximately 9.2 gallons per hour." A review of Section V (performance) of Beechcraft's Pilot's Operating Handbook for B23 airplanes (serial numbers M-1095 thru M-1284) with Avco Lycoming model O-360-A2G 180 horsepower engines, revealed that fuel flows for any maneuver requiring more than 84% brake horsepower, at altitudes of 4,500 feet msl or lower, would be expected to be between 12.5 and 13.2 gallons per hour.

Student pilot Information

Certificate:	Student	**Age:**	44,Male
Airplane Rating(s):	None	**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 With waivers/limitations	**Last FAA Medical Exam:**	August 19, 2010
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	61 hours (Total, all aircraft), 61 hours (Total, this make and model), 23 hours (Pilot In Command, all aircraft), 45 hours (Last 90 days, all aircraft), 21 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N6991Q
Model/Series:	B23	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	M-1098
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	August 1, 2010 Annual	**Certified Max Gross Wt.:**	2450 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2320 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-360-A2G
Registered Owner:	Desert Oasis Veterinary Enterprises LLC	**Rated Power:**	180 Horsepower
Operator:	Desert Oasis Veterinary Enterprises LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.81 inches Hg	**Temperature/Dew Point:**	26°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Henderson, NV (KHND)	**Type of Flight Plan Filed:**	None
Destination:	Henderson, NV (KHND)	**Type of Clearance:**	None
Departure Time:	06:45 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	35.79861,-115.27861(est)

Administrative Information

Investigator In Charge (IIC):	Anderson, Orrin
Additional Participating Persons:	Gary Campbell; Las Vegas FSDO; Las Vegas, NV
Original Publish Date:	April 24, 2012
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=80809