



# Aviation Investigation Final Report

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<b>Location:</b>	Worland, Wyoming	<b>Accident Number:</b>	CEN17LA356
<b>Date &amp; Time:</b>	September 12, 2017, 16:30 Local	<b>Registration:</b>	N1835R
<b>Aircraft:</b>	Cessna R182	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Fuel exhaustion	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Aerial observation		

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## Analysis

The commercial pilot reported that, about halfway through the planned pipeline surveillance flight, the engine experienced a total loss of power and he performed a forced landing to a dirt road. A postaccident examination revealed that both fuel tanks appeared to be empty; the left wing fuel tank cap seal appeared to be worn, and the left wing exhibited fuel staining aft of the fuel cap, consistent with fuel siphoning from the tank in flight.

The airplane was fueled the preceding night, and the pilot had assumed the fuel tanks were full upon departing on the first flight of the day. The airplane was flown 2.7 hours on the morning of the accident before it was refueled. The pilot did not recall visually confirming the fuel level following that refueling. An additional 4.1 hours of flight time elapsed from the time the airplane was refueled until the accident. According to the pilot, the airplane's fuel gauges were unreliable. To compensate, he had adopted the practice of completely filling the fuel tanks during each refueling, tracking the intervening flight time, and calculating fuel burn based on the airplane's average fuel consumption rate. Two days before the accident, an individual refueling the airplane informed him that the left fuel cap seal was torn. A new fuel cap seal had not yet been installed.

Although the amount of fuel lost through the cap could not be quantified, the unreliable fuel gauges did not allow the pilot to monitor either the normal fuel consumption nor alert him to the potentially abnormal rate of consumption due to the siphoning fuel. In addition, the pilot failed to verify the amount of fuel onboard before departure, which further rendered his method of tracking fuel consumption inaccurate.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's decision to operate an airplane with unreliable fuel gauges and the worn fuel cap seal that allowed fuel to siphon from the left wing fuel tank, which ultimately resulted in a total loss of engine power due to fuel exhaustion.

## Findings

<b>Personnel issues</b>	Decision making/judgment - Pilot
<b>Personnel issues</b>	Preflight inspection - Pilot
<b>Aircraft</b>	Fuel quantity indicator - Inoperative
<b>Aircraft</b>	Fuel storage - Damaged/degraded
<b>Aircraft</b>	Fuel - Fluid level

## Factual Information

### History of Flight

<b>Enroute-cruise</b>	Fuel exhaustion (Defining event)
<b>Emergency descent</b>	Off-field or emergency landing

On September 12, 2017, about 1630 mountain daylight time, a Cessna R182 airplane, N1835R, was substantially damaged during a forced landing following a loss of engine power near Worland, Wyoming. The pilot was not injured. The airplane was registered to and operated by Meridian Flying Service as a 14 Code of Federal Regulations Part 91 aerial observation flight. Visual meteorological conditions prevailed. The flight was not operated on a flight plan. The flight originated from the Sloulin Field International Airport (ISN), Williston, North Dakota and was destined for the Worland Municipal Airport (WRL), Worland, Wyoming.

On the day of the accident, the pilot intended to continue a pipeline surveillance patrol that began the previous day. The initial flight of the day was from the Sidney-Richland Regional Airport (SDY) to ISN to pick-up a passenger. After departing from ISN, two sections of the pipeline system near ISN were observed and then the flight proceeded to the Stanley Municipal Airport (08D) to obtain fuel. After fueling, the pilot departed for ISN to drop off the passenger. After departing ISN again, he planned to fly directly to the next pipeline system near WRL. However, smoke from forest fires prevented a direct flight as planned. He deviated as required, ultimately arriving at the start of the pipeline patrol route.

About 1620, approximately halfway through the patrol, the engine lost power. The pilot turned toward a road in the area in preparation for a forced landing. The engine regained power momentarily, but it quit again. He turned toward a highway and during that time the engine regained power and quit three or four more times. He recalled thinking that plenty of fuel should have been onboard as he attempted to determine the source of the problem. When he was unsuccessful restoring engine power, he setup for a forced landing to a dirt road. To clear a set of power lines, he "stretched" the glide causing the airspeed to decay and the airplane began to stall. He ultimately executed a forced landing to the dirt road with the landing gear retracted.

The pilot noted that the airplane fuel gauges were unreliable. Attempts to repair the gauges in the months before the accident were not successful and replacement of the entire gauge cluster was required; however, the airplane owner reportedly did not have the financial resources to complete the work. To compensate, the pilot had adopted the practice of completely filling the fuel tanks during each refueling and tracking the intervening flight time. Two days before the accident an individual refueling the airplane informed the pilot that the left fuel cap seal was torn. The pilot was in the process of obtaining a new fuel cap seal but had not been able to have one installed.

The pilot stated that the airplane was fueled at SDY the preceding night. He assumed that the fuel tanks were full upon his departure from SDY the morning of the accident. The airplane fuel capacity was 75 gallons useable. When the airplane was subsequently fueled at 08D, the self-service fuel pump required prior input of the desired amount of fuel. As a result, he decided to dispense 40 gallons based on the

anticipated burn that morning. However, he did not recall visually confirming the fuel level. The pilot reported that the flight time from SDY until refueling at 08D was 2.7 hours. An additional, 4.1 hours elapsed from the time the airplane was refueled at 08D until the accident.

A Federal Aviation Administration inspector reported that the airplane sustained firewall and fuselage damage. The upper surface of the left wing exhibited fuel staining aft of the fuel cap. The upper surface of the right wing was clean. The left and right fuel tanks appeared to be empty; no fuel was present when the sump drains were opened. The left fuel cap seal was worn; the right fuel cap seal appeared to be intact. The fuel selector was set to both tanks at the time of the examination. No other anomalies consistent with a preimpact failure or malfunction were observed.

FAA regulations (14 CFR 91.205) required an operable fuel gauge indicating the quantity of fuel in each tank for any powered civil aircraft with a standard category airworthiness certificate.

### Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	57, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	October 11, 2016
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	April 30, 2017
<b>Flight Time:</b>	2067 hours (Total, all aircraft), 661 hours (Total, this make and model), 1957 hours (Pilot In Command, all aircraft), 138 hours (Last 90 days, all aircraft), 61 hours (Last 30 days, all aircraft), 12 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N1835R
<b>Model/Series:</b>	R182	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1978	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	R18200576
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	September 1, 2017 Annual	<b>Certified Max Gross Wt.:</b>	3100 lbs
<b>Time Since Last Inspection:</b>	24 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	2083.4 Hrs at time of accident	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	O-540-J3C5D
<b>Registered Owner:</b>	Meridian Flying Services Inc.	<b>Rated Power:</b>	235 Horsepower
<b>Operator:</b>	Meridian Flying Services Inc.	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	WRL,4252 ft msl	<b>Distance from Accident Site:</b>	12 Nautical Miles
<b>Observation Time:</b>	15:53 Local	<b>Direction from Accident Site:</b>	270°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	4 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.94 inches Hg	<b>Temperature/Dew Point:</b>	33°C / 4°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Williston, ND (ISN )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Worland, WY (WRL )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	Worland Municipal WRL	<b>Runway Surface Type:</b>	Dirt
<b>Airport Elevation:</b>	4252 ft msl	<b>Runway Surface Condition:</b>	Dry;Rough
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 None	<b>Latitude, Longitude:</b>	43.962776,-107.950553(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Sorensen, Timothy
<b>Additional Participating Persons:</b>	Bruce J Hanson; FAA Flight Standards; Casper, WY
<b>Original Publish Date:</b>	July 5, 2018
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=96026">https://data.nts.gov/Docket?ProjectID=96026</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).