# Aviation Investigation Final Report

| | | | |
|---|---|---|---|
| **Location:** | Dixie, Idaho | **Accident Number:** | SEA02FA007 |
| **Date & Time:** | October 16, 2001, 21:15 Local | **Registration:** | N756CE |
| **Aircraft:** | Cessna TR182 | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | | **Injuries:** | 2 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The pilot departed Boise, Idaho, in the Lycoming O-540-L3C5D powered Cessna TR182 arriving at Ft. Collins 3.0 hours of tach time later on the day before the accident. The aircraft departed Boise with full (88 gallons useable) fuel tanks and remained overnight at Ft. Collins where there was no overnight security available. The aircraft was fueled with 30 gallons of fuel at Ft. Collins the next day with 20 gallons in the right tank (to full according to the fueler) and 10 gallons in the left tank (to 3/4 full according to the fueler). A credit card receipt for this fueling was date/time stamped for 1712. A radar track showed the aircraft flying westbound crossing 7 nm south of Pocatello and 21 nm north of Gooding, Idaho, where public airports with lighted runways and fuel were located. At 2112, in dark night conditions, the pilot radioed Salt Lake Air Route Traffic Control that he had an engine out and about one minute later referenced a 'field on fire' as a potential landing site. The aircraft impacted terrain in the bottom of a shallow (+12 degree sloped) bowl in mountainous/hilly terrain throughout which a controlled burn was underway. The left wing outboard leading edge impacted first, followed by the engine and there was no post-crash aircraft related fire. The landing gear were down and the flaps were retracted. The tach at the accident site read a total of 6.6 hours from the Boise departure reading. Less than a pint of fuel was extracted from the aircraft's fuel system and there was no evidence of fuel leakage/staining on the aircraft. The pilot operating handbook performance data section showed the highest cruise fuel burn rate for the aircraft's engine was about 15.2 gallons/hour. Documentation found within the aircraft tracking tach times, fuel, location(s) and date from 1996 forward referenced fuel burn rates ranging as high as 19.0 gallons/hour.

## Probable Cause and Findings

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

The pilot's failure to refuel en route resulting in fuel exhaustion, and his inadvertent entry into a stall condition during the emergency descent.  Contributing factors were dark night conditions and mountainous/hilly terrain.

## Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: DESCENT

Findings
1. (C) FLUID,FUEL - EXHAUSTION
2. (C) REFUELING - NOT PERFORMED - PILOT IN COMMAND
---

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING
---

Occurrence #3: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
3. (F) LIGHT CONDITION - DARK NIGHT
4. (C) STALL - INADVERTENT - PILOT IN COMMAND
---

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY

## Factual Information

HISTORY OF FLIGHT

On October 16, 2001, approximately 2115 mountain daylight time, a Cessna TR182, N756CE, registered to a partnership and being flown by a private pilot, collided with terrain following a total loss of power and then a loss of control in flight during cruise/descent, approximately two nautical miles (nm) north of Dixie, Idaho. The pilot and passenger both sustained fatal injuries. Visual meteorological conditions prevailed under dark night conditions, and a VFR flight plan had been filed. The flight, which was personal and related to the pilot's business, was operated under 14CFR91, and had originated from the Fort Collins downtown airport (3V5), Fort Collins, Colorado, approximately 1745 mountain daylight time. The flight was destined for Boise (BOI), Idaho.

According to the Federal Aviation Administration (FAA) Form 8020-9 issued following the accident, the aircraft first appeared on radar at the Cheyenne VOR (CYS) 198 degree radial at 38 nautical miles (this position was approximately seven nm west northwest of the 3V5 airport). The aircraft was first noted at 1815 hours and was under flight following thereafter. At 2114 hours, the pilot radioed Salt Lake Air Route Traffic Control Center that he had "lost his engine" and was executing a forced landing. The aircraft crashed into moderately rolling, sage covered terrain that was sparsely populated. The landowner had initiated a controlled burn at the accident site earlier in the day, and reported numerous small embers and ignition sources scattered throughout the area of the crash site upon his arrival. There was no post crash aircraft related fire at the site.

On the morning of October 15th at the request of the pilot, a fueler at Conyan Aviation, Inc. (a fixed base operator used by the pilot at the Boise Air Terminal, Boise, Idaho) fueled the aircraft. The fueler was interviewed and provided a written statement (refer to attachments F-I and FS-I). He reported that he added 67.5 gallons of fuel (100 Low Lead) to the aircraft bringing the fuel amount up to within one-half inch below each fuel tank filler neck. The aircraft was then tugged back to its original tie-down spot. It was not known what time N756CE departed Boise. The pilot's wife reported that she expected her husband to be returning from Ft. Collins, Colorado, on October 16th.

The line attendant at the Ft. Collins Downtown airport (3V5) was interviewed and reported that following his arrival at 3V5 the pilot of N756CE requested that his aircraft be fueled with 30 gallons of 100LL fuel prior to noon on October 16th. The line attendant further reported that the pilot arrived at the airport just before noon on October 16th, and told the fueler to put 20 gallons of fuel in the right main tank and 10 gallons in the left. The fueler reported that after this was done, the right tank was full and the left tank was approximately three-quarters full (refer to attachment LA-I). Ft. Collins Downtown airport lies eight nm north of the Ft.

Collins/Loveland Municipal airport (identifier FNL). The Ft. Collins Downtown airport has no secure area for transient overnight parking.

A fuel slip dated October 15th documented the purchase of 30.0 gallons of 100LL aviation fuel at the Fort Collins Downtown airport for aircraft N756CE in the amount of $82.50 (refer to attachment FS-III). This fuel receipt was supported by a credit card receipt provided by the pilot's family showing a fuel purchase from the Fort Collins Downtown airport on October 16th at 1712 hours mountain time. The Fort Collins Downtown airport daily fuel record sheet for October 15/16th showed that on October 16th N756CE was fueled with 30.0 gallons of fuel and that the truck meter read 366855.9 preceding the fueling and 366885.9 thereafter (refer to attachment FR-I).

Radar data assigned to a discreet transponder code of 1416 on the evening of October 16th, and recorded by the FAA's Salt Lake City (SLC) Air Route Traffic Control Center (ARTCC) was reviewed (refer to attachment RD-I). The data showed the first target recorded at 1834:03. The target was reporting an altitude of 17,600 feet above mean sea level (MSL) and located at 41 degrees 26.300 minutes North latitude and 107 degrees 38.883 minutes West longitude (31 nm bearing 210 degrees magnetic from Rawlins, Wyoming).

Six targets recorded following the 1834:03 target and a seventh target (1835:10) showed the aircraft reporting an altitude of 17,600 feet MSL and at 41 degrees 26.883 minutes North latitude and 107 degrees 41.833 minutes West longitude (14,000 feet beyond and on a bearing 272 degrees magnetic from the first target).

The radar track recorded a target traveling westbound at 2016:00 at a location 7 nm south-southeast of the Pocatello Regional airport, Pocatello, Idaho, and another target traveling westbound at 2055:17 at a location 21 nm north of the Gooding Municipal airport, Gooding, Idaho. Both of these airports are open to the public, equipped with lighted runways, and provide general aviation fuel.

The last radar target recorded was at 2114:18 and was reporting an altitude of 6,900 feet (MSL). This target was 2, 750 feet bearing 161 degrees magnetic from the ground impact site. A review of the radar data showed the beginning of a descent from 10,100 feet MSL between the 2111:58 and 2112:21 targets and continuing through the last radar target. The last three radar targets showed a left hand turn with an estimated turn radius of 1,600 feet (refer to attachment RP-I).

Approximately 2112, N756CE contacted SLC ARTCC and radioed "Ah, we've got an engine out and we're gonna do an emergency landing right here." Several radio exchanges transpired during which the controller inquired as to whether the aircraft would make the intended airport for the landing. Approximately 60 seconds after the initial radio contact N756CE radioed in answer "Negative, we're gonna - we've got a field on fire here - might try to land there." Approximately 30 seconds later N756CE acknowledged executing an emergency checklist after an inquiry by the controller. No further radio communications were recorded.

## PERSONNEL INFORMATION

The pilot held a private pilot certificate issued September 14, 1992, with airplane single-engine land and airplane instrument ratings. He received a third class medical certificate dated April 10, 2001, with the restriction that he "must wear corrective lenses." At the time of this last physical the pilot reported that he had a total of 3,400 hours of flight time.

## AIRCRAFT INFORMATION

N756CE, a Lycoming O-540-L3C5D powered aircraft with retractable landing gear was equipped with a single integral fuel tank in each wing. The capacity of each tank was 46 gallons of which 2 gallons was reported as unusable in the pilot operator handbook (total usable system fuel of 88 gallons - refer to attachment POH-I).

Additionally, the POH was reviewed for fuel consumption rates in the performance section (RPM range 2100/2200/2300/2400 RPM, temperature range -9/+11/+31 degrees C., and pressure altitudes of 2,000 feet through 20,000 feet in 2,000 foot increments). The highest fuel consumption noted was 15.2 gallons per hour (refer to attachment POH-II).

A notepad was recovered at the accident site containing a running columnar tally, which included dates (month/day format), origination point, destination point, numerical value noted in tenths (three significant figures minimum), and numerical value noted in tenths (two significant figures minimum), along with remarks (refer to attachment TT-I). There were twelve pages that were noted to be in consecutive order. The last line of data provided the following entry: "10/15 BOI FLN 38.4 blank IFR" and the line of data immediately prior provided the following entry: "10/1 06U BOI 35.4 blank IFR." The difference between the two numerical readings was noted to be 3.0.

The aircraft airframe log was reviewed and it was noted that the last annual inspection was signed off on May 1, 2001. The aircraft's recording tach time was logged as 3780.1 hours on that date and the aircraft's total airframe time was also logged as 3780.1 hours (refer to attachment AFL-I).

The eleventh page of the previously discussed notepad data contained the following entry: "5/3 BOI LGU 81.8 1.5 blank." The last three digits of the fourth column (81.8) were 1.7 hours past the last three digits of the aircrafts five-digit tach time at the previously cited annual inspection (3780.1).

The previously described notepad data also contained numerous references to fuel consumption, most of which were found within the first four pages. The gallons per hour (gph) fuel burn rates noted on these pages ranged from as low as 16 up to 19.0 gph (refer to

attachment AFL-I).

## METEOROLOGICAL AND ENVIRONMENTAL INFORMATION

The 2055 mountain daylight surface weather observation for Mountain Home Air Force Base, bearing 210 degrees magnetic and 26 nm from the accident site reported the highest cloud deck as a broken layer 22,000 feet above the reporting station with a second broken deck at 15,000 feet. Surface winds were from 080 degrees magnetic at 12 knots and the visibility was 7 nm. Dark night environmental conditions prevailed. The owner of the agricultural property on which the aircraft crashed reported that on the afternoon of the accident he had initiated a controlled brush burn, which continued to burn into the evening. Numerous areas around the accident site showed burned brush and occasional areas still smoking the afternoon following the accident. Upper air atmospheric soundings for Denver, Colorado, Rawlins, Wyoming, and Boise, Idaho, taken at midnight on the night of the accident reported winds aloft at selected pressure altitudes/elevation (meters). Refer to attachments UA-I, II, and III.

## WRECKAGE AND IMPACT INFORMATION

The aircraft crashed in an area of moderately hilly ranchland covered with occasional sage, much of which had been consumed in a ground fire. The accident site coordinates were determined using a hand held GPS unit and were found to be 43 degrees 20.984 minutes north latitude and 115 degrees 26.771 minutes west longitude. The elevation of the accident site was approximately 5000 feet MSL (refer to CHART I).

The first evidence of ground impact (initial ground impact site) was a shallow cut in the soft soil progressing along a 302 degree magnetic bearing for approximately 28.5 feet to a broader area of disturbed soil (engine impact). The aircraft (forward portion of the engine), excluding the propeller and nose gear strut and wheel, was observed approximately 37.5 feet further beyond the area of broadly disturbed soil and along the same bearing line (refer to photograph 1). The slope of the terrain from the initial ground impact site west-northwest was measured as +11 degrees and extended for approximately 500 feet after which the terrain abruptly sloped down steeply approximately 700 feet to the Anderson Ranch Reservoir. The slope of the terrain from the initial ground impact site east-southeast was measured as +12 degrees and extended for approximately 325 feet to a single high conifer tree the top of which was approximately 150 feet above the elevation of the initial ground impact site (refer to photograph 2). Three shallow impact depressions with fragments/markings related to all three main landing gear were observed in a line approximately paralleling the 302 degree magnetic bearing and slightly northeast of the engine impact crater. The propeller and nose wheel/strut were observed a short distance west of the engine impact crater with several large pieces of windscreen (Plexiglas) just beyond (refer to photographs 3 and 4). A shallow cut similar to the initial ground impact mark was observed extending on a bearing of 284 degrees from the center of the engine impact area and approximately 20 feet west (refer to DIAGRAM

I).

Small fragments of plastic associated with the left wingtip were found embedded in the soil at the initial ground impact site. The aircraft, i.e., fuselage, engine, left and right wings, empennage and all tail control surfaces was observed at rest upright with the aircraft's longitudinal axis along a 140/320 degree magnetic bearing (nose southeast). The aircraft's left wing had fractured near the carry through at the fuselage attach point and deformed upward approximately 90 degrees from its normal position. The leading edge of the wing displayed substantial aftward deformation increasing in severity toward the tip. Additionally, the wing was deformed upward and aft with increasing severity progressing toward the wingtip.

The right wing remained attached in its normal position and displayed minimal leading edge damage. The only significant deformation to this wing was an approximate 25 degree upward bend at a location midway between the strut attach point and the wingtip and along the chordline. The flaps were observed in the fully retracted position, confirmed by the jackscrew extension (refer to photographs 5 through 8).

The empennage displayed a diagonal buckling fracture approximately 45 degrees to the aircraft's longitudinal axis. All horizontal and vertical control surfaces were observed attached and displayed minimal damage (refer to photographs 9 and 10). There was no evidence of any control discontinuity (ailerons, elevators, rudder and elevator trim tab).

The main landing gear were out of their wheel wells and the "Gear Down and Locked" green peanut light bulb filament was found to be stretched when examined under a magnifying glass. Similarly, the "Gear in Transit" peanut light bulb filament was observed to be broken but its filament was not stretched (refer to Supplements A and B for additional aircraft and instrumentation documentation).

The engine was examined on site and no evidence of pre-impact malfunction was observed.

During the engine examination approximately one teaspoon of fuel was recovered from the carburetor fuel bowl at the drain plug. No fuel was found within the fuel lines feeding in and out of the engine driven fuel pump. Examination of the airframe revealed approximately 10 milliliters of fuel in the left wing fuel lines. Approximately four ounces of fuel was found within the right fuel tank. Examination of the airframe revealed no staining signatures around the fuel caps or vent/drain lines, nor any evidence of fuel staining on the wings or underside of the aircraft's engine/fuselage.

## MEDICAL AND PATHOLOGICAL INFORMATION

Although requested, a post-mortem examination of the pilot was not conducted. However, toxicological samples were drawn and submitted. The FAA's Toxicology Accident and

Research Laboratory, Oklahoma City, Oklahoma conducted toxicological evaluation of samples from the pilot. The only findings reported were a detection of "quinine" in both blood and urine (refer to attached TOX report).

TESTS AND RESEARCH

The tie-down spot at Conyan Aviation, where the aircraft had been tugged to prior to its October 15th departure was examined. There was no evidence of any significant fuel staining or leakage at the spot and the facilities of Conyan Aviation were observed to be within the secure fenced area of the Boise Air Terminal.

ADDITIONAL INFORMATION

On-site examination of the wreckage was conducted on October 17-18, after which the wreckage was verbally released to the insurance representative. Written wreckage release was accomplished on August 1, 2002, and is documented on NTSB form 6120.15 (enclosed).

## Pilot Information

| | | | |
|---|---|---|---|
| **Certificate:** | Private | **Age:** | 54,Male |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 3 Valid Medical--w/ waivers/lim | **Last FAA Medical Exam:** | April 10, 2001 |
| **Occupational Pilot:** | | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 3400 hours (Total, all aircraft) | | |

## Aircraft and Owner/Operator Information

| | | | |
|---|---|---|---|
| **Aircraft Make:** | Cessna | **Registration:** | N756CE |
| **Model/Series:** | TR182 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | R18201036 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | May 1, 2001 Annual | **Certified Max Gross Wt.:** | 3100 lbs |
| **Time Since Last Inspection:** | 293.9 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 3842 Hrs at time of accident | **Engine Manufacturer:** | Lycoming |
| **ELT:** | Installed, activated, did not aid in locating accident | **Engine Model/Series:** | O-540-L3C5D |
| **Registered Owner:** | KRK Partnership | **Rated Power:** | 235 Horsepower |
| **Operator:** | Holzer, George L. | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

| | | | |
|---|---|---|---|
| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Night/dark |
| **Observation Facility, Elevation:** | MUO,2996 ft msl | **Distance from Accident Site:** | 27 Nautical Miles |
| **Observation Time:** | 20:55 Local | **Direction from Accident Site:** | 210° |
| **Lowest Cloud Condition:** | | **Visibility** | 7 miles |
| **Lowest Ceiling:** | Broken / 15000 ft AGL | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 12 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 80° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29.93 inches Hg | **Temperature/Dew Point:** | 17°C / -2°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Fort Collins, CO (3V5 ) | **Type of Flight Plan Filed:** | VFR |
| **Destination:** | Boise, ID (BOI ) | **Type of Clearance:** | VFR |
| **Departure Time:** | | **Type of Airspace:** | Class G |

## Wreckage and Impact Information

| | | | |
|---|---|---|---|
| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | 1 Fatal | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 2 Fatal | **Latitude, Longitude:** | 43.349723,-115.446113 |

## Administrative Information

| | |
|---|---|
| **Investigator In Charge (IIC):** | Mccreary, Steven |
| **Additional Participating Persons:** | Jerry B McClellin; FAA FSDO; Boise, ID<br>Andrew Hall; Cessna Aircraft Company; Wichita, KS<br>Mark W Platt; Textron Lycoming; Van Nuys, CA |
| **Original Publish Date:** | April 18, 2003 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=53644 |