# Aviation Investigation Final Report

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| **Location:** | Kalispell, Montana | **Accident Number:** | WPR14LA269 |
| **Date & Time:** | June 25, 2014, 17:00 Local | **Registration:** | N7350Y |
| **Aircraft:** | Piper PA 30 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Fuel starvation | **Injuries:** | 2 Minor |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The commercial pilot reported that, during takeoff for the cross-country flight, the right engine lost power. The airplane, which was about 10 ft above the ground, then veered right away from the runway. The pilot immediately switched fuel tanks, raised the landing gear, and feathered both propellers. Subsequently, the airplane entered about an 80-degree right bank, and the pilot was able to get the airplane nearly level, applying full left aileron and rudder, just before it contacted the ground. The airplane came to rest about 500 ft off the right side of the runway. During the accident sequence, the right engine separated from the fuselage. After the accident, the pilot shut off the fuel valves; he did not recall which position the fuel selectors were set to for takeoff. Postaccident examination of the airframe and right engine did not reveal any anomalies or failures that would have precluded normal operation.

Postaccident examination of the airplane revealed that the main fuel tanks appeared to be empty but that the auxiliary tanks, which have a total capacity of 30 gallons, appeared to be almost full. The pilot reported taking off with a total fuel quantity of 30 gallons; therefore, most of the usable fuel was in the auxiliary tanks. The airplane flight manual states that, for takeoff, the fuel selectors should be selected "on" to the main fuel tanks. It is likely that the pilot followed these procedures, which led to the fuel starvation of the right engine. The Pilot's Operating Handbook preflight check included a step to visually check each tank's fuel quantity on the gauge and to visually check the fuel quantity in each tank during the walkaround inspection. Based on the evidence, it is likely that the pilot did not adequately follow these procedures before the flight.

## 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 and checks, during which he failed to determine the quantity and distribution of the fuel, which resulted in the loss of right engine power during takeoff due to fuel starvation.

## Findings

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| **Personnel issues** | Fuel planning - Pilot |
| **Personnel issues** | Preflight inspection - Pilot |
| **Aircraft** | Fuel - Fluid management |
| **Personnel issues** | Use of equip/system - Pilot |

# Factual Information

## History of Flight

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| **Takeoff** | Fuel starvation (Defining event) |
| **Takeoff** | Loss of engine power (partial) |
| **Takeoff** | Runway excursion |

On June 25, 2014, about 1700 mountain daylight time, a Piper PA 30 Twin Comanche, N7350Y, collided with terrain following a loss of engine power on the right engine during takeoff from Glacier Park International Airport, Kalispell, Montana. The pilot/owner was operating the airplane under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91. The private pilot and passenger sustained minor injuries. The airplane sustained substantial damage to the right wing and fuselage during the accident sequence. Visual meteorological conditions prevailed, and no flight plan had been filed. The cross-country personal flight was originating at the time with a planned destination of Eureka, Montana.

The pilot reported that the right engine did not sputter or provide any other indications before losing power. The airplane was airborne about 10 feet above the ground when it veered to the right, away from the runway. The pilot immediately switched fuel tanks, raised the gear, and feathered both propellers. The airplane went into a right bank to about 80 degrees, and the pilot was able to get the airplane nearly level, applying full left aileron and rudder, just prior to contacting the ground. During the accident sequence, the right engine separated from the fuselage.

The airplane came to rest upright about 5,500 feet down the runway and 500 feet off to the right side of the runway.

The pilot stated that he shut the fuel valves off after the accident, at the request of the on-scene fire personnel. The pilot stated concern that the right fuel selector was stiff, and the detent was not readily apparent. He did not recall what position the fuel selectors were set to for takeoff.

Examination of the accident site was conducted by a Federal Aviation Administration inspector and revealed that the airplane's fuselage and wings sustained substantial damage. The inspector observed no fuel leaking from the airplane. He stated upon inspection, the main tanks appeared to be dry and the axillary tanks were almost full. He also observed only a residue amount of fuel in the fuel distribution manifold for the fuel injection and in the right engine fuel line. The fuel selectors were observed in the "off" position. He established the continuity of the fuel line from the right fuel tank to the engine mount. Further, the inspector stated that the airport manager said that on the day of the accident, that there were no fuel spills or vapors at the accident site. The airplane was recovered to a secure location for further examination.

Postaccident examination of the airplane and engine was conducted by a certified airframe and powerplant mechanic, under the supervision of the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), and with an FAA inspector in attendance.

The right engine was examined. A differential cylinder pressure tester was used to check the appropriate pressure and resulted in no anomalies. The engine's condition was determined to be sufficient, to allow for the safe engagement of the starter. The starter was engaged and the engine gearing and propeller rotated, with no anomalies noted.

The fuel system continuity and the function of the fuel selectors were established. The right fuel selector detents were checked at each selected position. The examination and disassembly of the fuel selectors revealed no anomalies. The NTSB IIC verified the fuel quantity in the auxiliary (tip) tanks were about full. The fuel quantity was observed to be about two inches from the top of the tanks.

Flight control continuity was established throughout all primary flight control surfaces from the cockpit controls.

The examination of the airframe and engine revealed no evidence of mechanical anomalies or failures that would have precluded normal operations. For additional information, see the Airframe and Engine Examination Report in the Public docket.

The pilot reported to the NTSB IIC that the accident airplane had 30 gallons of fuel onboard during takeoff. He had flown the airplane about 3.7 hours since the last refueling and flew the last flight using the main fuel tanks. Reviewing the performance figures in the Airplane's Flight Manual (AFM), for the average engine fuel flow at the higher density altitudes, the reported 30 gallons of fuel remaining, for the accident flight seemed to be accurate. The airplane's total fuel capacity is 120 gallons with the tip (auxiliary) tanks. The tip tanks fuel capacity is 30 gallons. Additionally, there is 3 gallons of unusable fuel in each main tank.

The AFM procedure for takeoff calls for the fuel selector valves to be selected "on" to the main tanks. The selection of the auxiliary fuel tanks is approved only during level, cruise flight. The airplane's Pilot Operating Handbook preflight check has an item, to visually check each tanks fuel quantity on the gauge. Further, the handbook calls for the fuel tanks quantity to be visually checked, during the walk around inspection.

## Pilot Information

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| **Certificate:** | Commercial; Private | **Age:** | 52,Male |
| **Airplane Rating(s):** | Single-engine land; Multi-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | 3-point |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 2 With waivers/limitations | **Last FAA Medical Exam:** | March 1, 2013 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | April 9, 2013 |
| **Flight Time:** | (Estimated) 1300 hours (Total, all aircraft), 51 hours (Total, this make and model), 1300 hours (Pilot In Command, all aircraft), 54 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 0.5 hours (Last 24 hours, all aircraft) | | |

## Passenger Information

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| **Certificate:** | | **Age:** | 32,Male |
| **Airplane Rating(s):** | | **Seat Occupied:** | Right |
| **Other Aircraft Rating(s):** | | **Restraint Used:** | 3-point |
| **Instrument Rating(s):** | | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | | **Toxicology Performed:** | No |
| **Medical Certification:** | | **Last FAA Medical Exam:** | |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Piper | **Registration:** | N7350Y |
| **Model/Series:** | PA 30 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 1964 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 30-404 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | |
| **Date/Type of Last Inspection:** | October 10, 2013 Annual | **Certified Max Gross Wt.:** | 2381 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 2 Reciprocating |
| **Airframe Total Time:** | 4862.15 Hrs as of last inspection | **Engine Manufacturer:** | LYCOMING |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | IO-320 SERIES |
| **Registered Owner:** | RIDGEAIRE INC | **Rated Power:** | 160 Horsepower |
| **Operator:** | RIDGEAIRE INC | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | KGPI,2977 ft msl | **Distance from Accident Site:** | 0 Nautical Miles |
| **Observation Time:** | 16:55 Local | **Direction from Accident Site:** | 0° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 3 knots / | **Turbulence Type Forecast/Actual:** | / None |
| **Wind Direction:** | | **Turbulence Severity Forecast/Actual:** | / N/A |
| **Altimeter Setting:** | 29.86 inches Hg | **Temperature/Dew Point:** | 24°C / 7°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Kalispell, MT (GPI ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Eureka, MT (88M ) | **Type of Clearance:** | VFR |
| **Departure Time:** | 17:00 Local | **Type of Airspace:** | Class D |

## Airport Information

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| **Airport:** | Glacier Park International GPI | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 2977 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 20 | **IFR Approach:** | None |
| **Runway Length/Width:** | 9007 ft / 150 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Minor | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | 1 Minor | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 2 Minor | **Latitude, Longitude:** | 48.310554,-114.256111(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Nixon, Albert |
| **Additional Participating Persons:** | Bill Thomas; Federal Aviation Administration; Helena, MT |
| **Original Publish Date:** | June 1, 2016 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB did not travel to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=89541 |