



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

May 9, 2021

SUMMARY OF AIRPLANE EXAMINATION

(WPR18LA227)

This document contains 28 embedded photos.

A. ACCIDENT

Location:	1.56 nm north-northwest of Flying B Ranch, and 36.3 nm north-northwest of Challis, ID
Date:	August 18, 2018
Aircraft:	N84CP, Cessna 182Q
NTSB Investigator-in-Charge	Thomas Little

B. EXAMINATION PARTICIPANTS

Thomas Little
Senior Aviation Accident Investigator
National Transportation Safety Board
Western Pacific Region
Federal Way, Washington

Rudy Rossi
Aviation Safety Inspector
Federal Aviation Administration
Boise Flight Standards District Office
Boise, Idaho

Peter Basille
Senior Air Safety Investigator
Textron Aviation
Wichita, Kansas

Christopher Lang
Air Safety Investigator
Continental Motors
Mobile, Alabama

C. SUMMARY

On August 18, 2018, about 1150 mountain daylight time, a Cessna 182Q airplane, N84CP, was substantially damaged during a forced landing about 2 nautical miles north-northwest of Flying B Airstrip (ID12), Salmon, Idaho. The airline transport pilot succumbed to his injuries about three months after the accident. The pilot-rated passenger was seriously injured. The airplane was registered to Gripnet Inc. and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed. The flight originated from ID12 about 1145 and was destined for McCall Municipal Airport (MYL), McCall, Idaho.

A friend of the accident pilot, who was piloting the airplane in trail, reported that prior to departing he and the accident pilot briefed the departure route. The route was to take off to the north, or downstream of the Middle Fork of the Salmon River, then reverse course 180° and proceed upstream toward Indian Creek Airstrip while en route to MYL. The trail pilot reported that after taking off he observed the accident pilot make a left 90° turn to the west and proceed up Short Creek, rather than the previously briefed 180° turn. The trail pilot opined that he was confused as to why the accident pilot was heading up Short Creek, since you cannot out climb the rising terrain to the west, "...as it is a tight little canyon to turn in." The trail pilot mentioned that he subsequently radioed the accident pilot and asked, "Where are you going?" The accident pilot replied, "I'm going down." The trail pilot reported that prior to impact the airplane was very slow, was headed upstream (west) in the middle of Short Creek, there was no excessive wing rocking, and the airplane was being held perfectly still as it impacted the top of a stand of trees. The trail pilot mentioned that the airplane came rest intact and oriented in a westerly direction the canyon. He added that while he was in a 360° turn orbiting the area, he observed a fire on the left side of the airplane; the airplane was subsequently consumed.

The airplane was recovered to a secured salvage facility for a postaccident examination.

D. DETAILS OF THE POSTACCIDENT EXAMINATION

The postaccident examination of the wreckage was performed at the facilities of SP Aircraft, Boise, Idaho, on November 29, 2018. The examination was under the supervision of the NTSB investigator-in-charge, assisted by field representatives from Textron Aviation and Continental Motors.

As a result of the examinations performed on the engine and the airframe, it was revealed that there was no evidence of preimpact mechanical malfunctions that would have precluded normal operation with either.

The following is a compilation of postaccident examination notes, as provided by the NTSB IIC, and the field representatives of Textron Aviation and Continental Motors.

Engine examination notes

Engine model:	IO-470-F37B
Engine serial number:	1000358
Aircraft make & model:	Cessna 182Q
Aircraft serial number:	18267422
Aircraft registration:	N84CP
Total time:	264.6 as of last logbook entry dated 6/12/2018
Time since last overhaul:	N/A
Type/time since last inspection:	Unknown. Last 100-hour inspection was completed on 6/12/2018 at 264.6 hours since factory rebuilt

Report summary:	Even though the engine was extensively damaged by the post-crash fire, the examination of this engine did not reveal any anomalies that would have prevented normal operation.
-----------------	--

<u>External inspection of engine</u>	The engine, engine mount and firewall had separated from the airframe, but remained together. The engine exhibited heavy thermal damage. Due to the thermal damage, the crankshaft would not rotate by hand. The firewall was then removed for the examination.
--------------------------------------	---



Figure 1 - view 1 of engine as received



Figure 2 - view 2 of engine as received

Engine Teardown and Component Examination

- Exhaust system: The exhaust system remained intact and exhibited impact damage.
- Inductions system: Th induction system was found to be mostly burned away by thermal activity.
- Ignition system: The left magneto was mostly burned away by thermal activity. Some of the magnetos internal parts remained mounted to the engine.



Figure 3 - photo of left magneto

The right magneto remained attached to the engine and exhibited thermal damage. When magneto was removed, the drive would not rotate by hand. The magneto was disassembled and the internal components exhibited thermal distress.



Figure 4 - photo of right magneto



Figure 5 - photo of right magneto

Ignition harness: The ignition harness exhibited thermal damage.



Figure 6 – photo of Ignition harness

Fuel System

Fuel pump: The fuel pump remained attached to the engine and exhibited thermal damage. The fuel pump drive could not be rotated. The drive coupling was intact. The fuel pump was disassembled and no evidence of pre-impact anomalies was noted.



Figure 7 - photo of fuel pump



Figure 8 - photo of fuel pump

Throttle Body: The throttle body had been burned away with only the throttle plate and hardware left. The mixture control remained attached to the firewall by the throttle and mixture control arms and exhibited thermal damage. The throttle control arm was found in the full position. The exact position of the mixture control was not determined.



Figure 9 - throttle body and metering unit



Figure 10 - throttle body and metering unit

Fuel Manifold Valve: The fuel manifold valve remained attached to the engine and was thermally damaged. The cover was partially melted away exposing and burning the diaphragm. Pieces of the burnt diaphragm were noted on the manifold valves fuel screen, but the screen was not blocked.



Figure 11 - fuel manifold valve



Figure 12 - fuel manifold valve



Figure 13 - fuel manifold valve

Fuel nozzles: The fuel nozzles were removed and unrestricted. The number 6 fuel nozzle was slightly bent.



Figure 14 - Fuel Nozzles

Oil Cooler: The oil cooler remained attached to the engine and was thermally damage.



Figure 15 - Oil Cooler

Cylinders

Cylinders: The cylinders remained attached to the engine. Thermal damage prevented removal of the number six valve cover. The top spark plugs were removed and the cylinder combustion chambers were examined with a lighted bore scope with no anomalies noted. The valves, valve springs and rocker arms were intact and thermally damaged. Bore scope pictures are of cylinder number 6.



Figure 16 - right side cylinders



Figure 17 - left side cylinders

Accessories

Starter: The starter remained attached to the starter adaptor and had been damaged by the post impact fire.



Figure 18 – Starter

Starter Adapter: The starter adaptor remained attached to the engine. The alternator pulley was partially melted away and the starter mounting flange was fractured.



Figure 19 - Starter Adapter

Alternator: The alternator had separated from the engine and was located with the airframe wreckage. The alternator was thermally damaged with most of the housing melted away.



Figure 20 – Alternator

Vacuum Pump: The vacuum pump remained attached and the cover was mostly melted away. The rotor and vanes appeared intact.



Figure 21 - Vacuum Pump

Propeller

Propeller Governor: manufacturer: McCauley P/N: C290D3J/T1 S/N: 794134

Condition: The propeller governor exhibited impact and thermal damage. The control arm was fractured away and not observed. The propeller governor drive did not rotate by hand. The gasket screen was free of obstruction.



Figure 22 - Propeller Governor



Figure 23 - Propeller Governor



Figure 24 - Propeller Governor

Propeller: The two-bladed propeller remained attached to the crankshaft propeller flange. One blade exhibited slight S shaped bend near the blade tip which was twisted aft slightly. The blade exhibited chordwise scratches and was missing material at the blade tip, leading edge and the trailing edge. The second blade exhibited chordwise and multi-directional scratches. From about the midspan of the blade to the tip was missing.



Figure 25 - view 1 of propeller



Figure 26 - view 2 of propeller



Figure 27 - view 3 of propeller



Figure 28 - view 4 of propeller

Airframe Examination

General The aircraft impacted terrain in a wings-level landing attitude and came to rest on the nose with the tail in the air. A post impact fire consumed the cabin.

Aircraft Systems

Flight Control System Information:

- The elevator, rudder, and elevator trim cables remained attached in the tail and were cut by recovery personnel in the forward cabin area. Fragments of the elevator, and rudder cables were observed attached to the interconnect elevator torque tube and the rudder torque tubes. Left and right aileron cable fragments were found connected to the left and right aileron bellcranks.

The flap actuator was observed loose in the pile of debris. Control cable fragments remained attached to the bellcrank.

Airframe Fuel System Condition, Controls and Read Outs

- Fuel strainer screen: undetermined
- Fuel strainer bowl: undetermined
- Main fuel tank gauge: left - undetermined right – undetermined
- Fuel selector handle: undetermined
- Fuel selector valve: undetermined
- Fuel boost pump: undetermined

Remarks: Most of the fuel system was consumed by the post-impact fire.

Landing Gear System

- Gear position: nose - fixed left - fixed right – fixed

Environmental System

- Cabin heater: undetermined
- Cabin vent: undetermined
- Defrost: undetermined
- Air Conditioner: N/A
- Oxygen system/quantity: undetermined

Icing System

- Certified into known icing? NO
- De-icing boots installed: NO
- Pitot heat: undetermined
- Stall heat: not applicable
- Anti-ice: Surface – not applicable
Propeller – undetermined
Windshield – not applicable

ELT Information

- Installed? YES
- Model: undetermined
- Type: undetermined
- Serial number: undetermined
- Battery due date: undetermined
- Armed: undetermined
- Activated: undetermined

Cabin and equipment furnishings

- Remarks: The seats frames sustained impact and fire damage. The seat upholstery and restraints were consumed by the post-impact fire.
- Instrument panel: The instrument panel sustained impact and fire damage.

Powerplant Description

- Remarks:
 - ✓ The engine sustained post-impact fire damage. The left magneto was melted and could not be tested. The right magneto sustained thermal damage and could not be rotated for testing. The top spark plugs appeared normally worn.
 - ✓ The propeller remained attached to the engine. One propeller blade was bent aft and the other was bent slightly forward. Both blades sustained post-impact fire damage and were partially consumed.

Additional aircraft and engine examination notes

1. Empennage – control continuity confirmed to all terminal area connections

- Rudder
Remained attached to the vertical stabilizer at all attach points.
Minor damage observed to the top aft area.
Thermal damage to the lower one-third, with heavy sooting.
Rudder control cables were observed attached to their respective origins.
- Vertical stabilizer
Remained attached to the aft fuselage at all attach points
Thermal damage observed to the lower one-third on the right side
Some thermal damage observed to the left lower area
- Right elevator
Destroyed by thermal and impact damage
Inner 24" observed attached to the right horizontal stabilizer's trailing edge
The respective trim tab was observed attached at its inboard attach points
The remainder of the tab was destroyed by impact forces

- Right horizontal stabilizer
The inboard 30" was observed attached to the right side of the aft fuselage with impact and thermal damage. The remainder of the stabilizer was destroyed due to thermal damage and impact forces.
- Left elevator
Moderate impact damage was observed from mid-span outboard
Some thermal damage was observed to the inboard 10"
The elevator remained attached to the left horizontal's trailing edge at all attach points.
The outboard 8" of the elevator was bent upwards at about a 45° angle
The elevator's trailing edge was bent and wrinkled at mid-span
- Left horizontal stabilizer
Remained attached to the aft fuselage at all attach points
The inner two-thirds had impact and thermal damage on both upper and lower surfaces.
Leading edge impact damage, about 10" wide, was observed about 28" outboard from the fuselage attach points.
The outboard 20" was bent upward at about a 45° angle.

2. Right wing

- The wing was so severely fragmented due to impact forces, as well as having sustained severe thermal damage, that it was not recognizable during the examination for documentation purposes.
- The only discernable components observed were the aileron bell crank, the flap actuator, and the roll servo. Associated control cables were observed connected to their termination point, with partial continuity documented.

3. Left wing

- The wing was observed at the accident site as having been separated from the airplane's fuselage due to impact forces as a result of the accident sequence.
- The wing had sustained leading edge impact damage through its span.
- The wing tip had separated from the wing upon initial impact with a stand of trees and came rest about 500 ft from the main wreckage site.
- The aileron remained attached to the wings trailing edge at all attach points. It was also observed to have been bent through its span.
- The wing's fuel tank was observed to have sustained thermal and impact damage and had been breached.
- The flap was destroyed as a result of the accident sequence.

4. Cabin/cockpit area

- Destroyed due to severe thermal damage and impact forces.

5. Aft fuselage
 - The area sustained impact forces and thermal damage so severe that it was unrecognizable.
6. Landing gear
 - All three (3) landing gear were separated from the airplane and sustained significant impact and thermal damage.
7. Power and propeller controls
 - The throttle, mixture and propeller control cables were observed intact from the firewall to their respective terminal points.
8. Engine
 - The engine was observed to have sustained significant thermal and impact damage as a result of the accident sequence.
 - All fuel nozzles were checked for obstructions and observed to be clear.
 - The spark plugs were observed to have had normal wear.
 - The engine was examined by a Continental Motors Senior Air Safety Investigator, who found no anomalies with the engine that would have precluded normal operation.

Thomas M. Little
Senior Aviation Accident Investigator
National Transportation Safety Board
Western Pacific Region
Federal Way, Washington