TESTS AND RESEARCH

Investigators from the Safety Board, Federal Aviation Administration and Cessna examined the wreckage on April 14, 2015, at the facilities of SP Aircraft, Boise, Idaho.

Airframe

The main wreckage came to rest partially submerged in a creek had been subjected to severe thermal damage. The main wreckage consisted of the wings, empennage, engine and the mostly ashen remains of the fuselage. The cabin was completely consumed by fire.

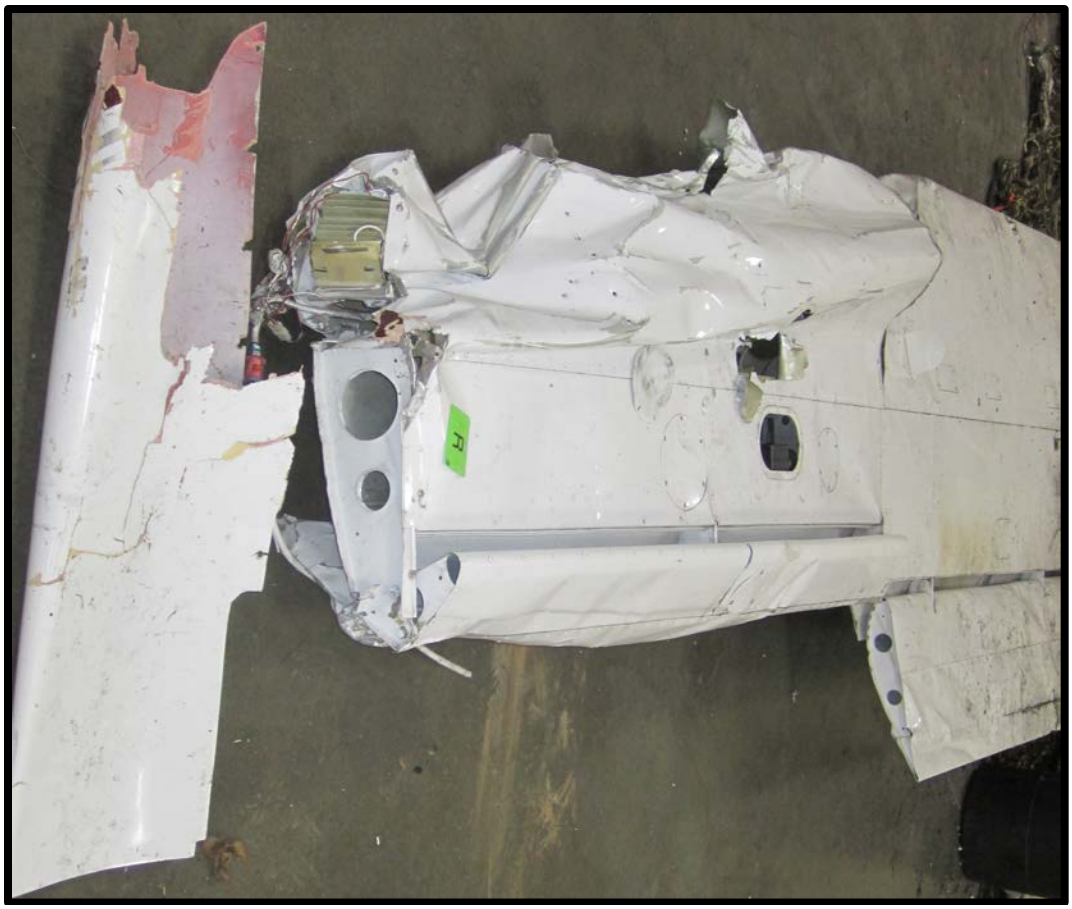
Picture 01: Upper Cabin Area

The left wing remained affixed to the fuselage with the aileron and wing flap control surfaces still attached at their respective hinges. The left wing had sustained thermal damage with the most concentrated damage to the inboard upper area. The wing sustained aft crush deformation to the inboard section that consisted of the leading edge skin being folded into itself giving it an accordianed appearance. The crush began at the inboard root and continued about 5 ft to the area with the greatest crush deformation present and the skin was fragmented from the leading edge back toward the trailing edge; the flap was additionally bent upward in that area. Further crush deformation was found to the left wing's outboard area, with the last 1 foot area folded aft about 6 inches. The wing tip, located about 35 ft upstream of the wreckage in the bush bordering the creek, was not attached and had burned; pieces of the red navigation lens were found near the wingtip. The bottom of the left aileron control surface was whiter that the surrounding flap and wing skin, consistent with it being subjected to less thermal exposure.

Picture 02: Upper Left Wing

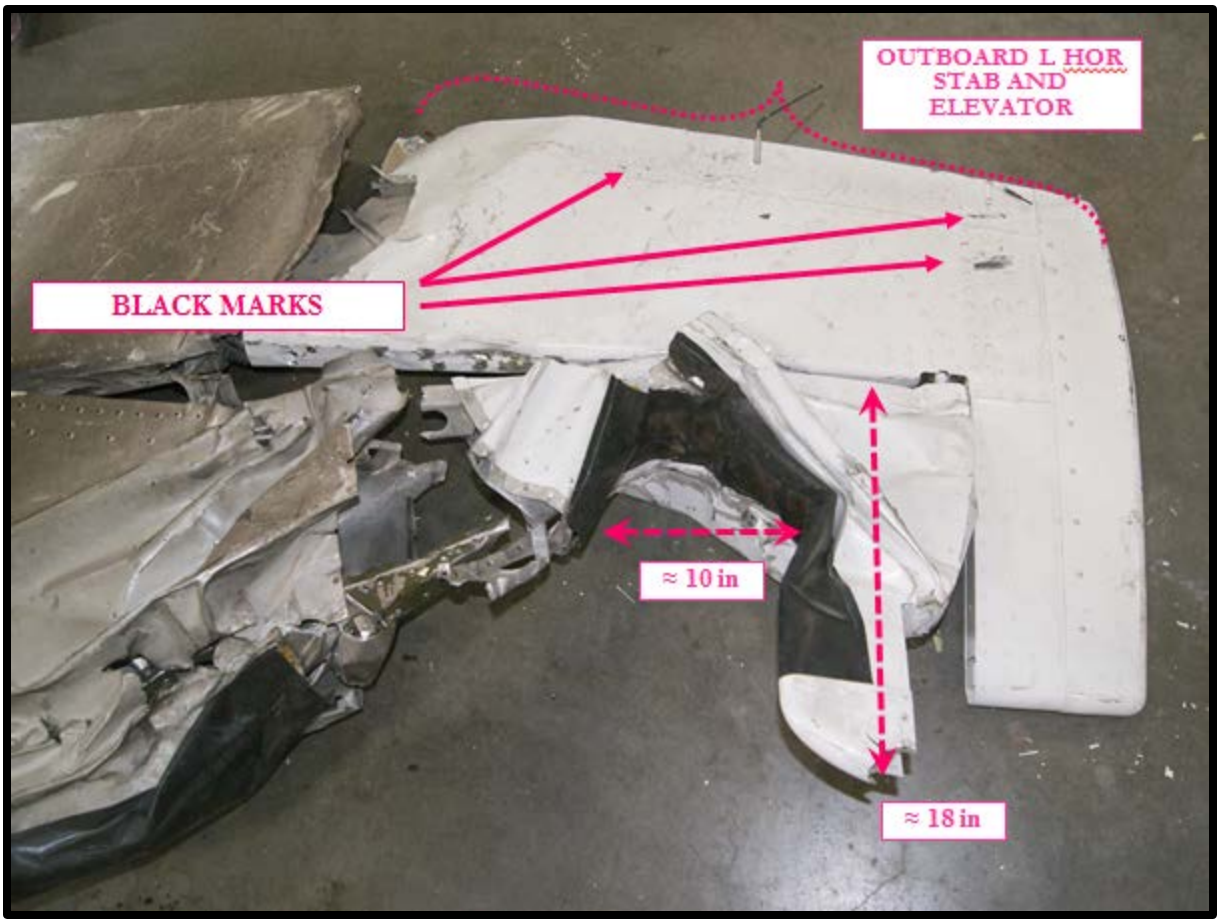
The right wing remained affixed to the fuselage with the aileron and wing flap control surfaces still attached at their respective hinges. The inboard 3 ft of the wing had sustained thermal damage and the remaining outboard area was not burned consistent with it being partially submerged in the creek. The outboard half of the leading edge displayed crush deformation with the skin folded into itself giving an accordianed appearance with three distinct divots noted. The wing tip, found about 10 feet upstream in the creek, was not attached and the leading edge was absent. The left aileron was hyper-extended upward and was found pinned under the wing, which had come to rest inverted.

The flap control surfaces were found in the retracted (flush) position. The actuator jackscrew was examined by measuring the exposed threads, which totaled 2.625 in. A representative from Cessna stated that the position of the jackscrew was consistent to the flaps being extended between 5 and 10 degrees. Flap cable continuity was established from the control surface to the cockpit area. The aileron cable continuity was established from the control surfaces to the control yoke assembly. The bell crank arms were all lodged past their respective stops.


Picture 03: Bottom Right Wing

The rudder control surface remained affixed to the vertical fin structure. There were several areas of crush damage and punctures on the leading edge of the vertical fin. The tail cone was intact. Investigators could manipulate the rudder through the full motion of travel making contact the stops. The rudder cables were attached to rudder horn, and continuity was established to the aft baggage compartment through a series of pullies and runs through lightning holes; the ends of the cables were thermally deteriorated. From the ashen remains of the cockpit, the rudder cables that remained, measuring about 36 in, were traced and found to be attached to their respective cockpit control assemblies.

The right elevator control surface was intact and remained attached to the horizontal stabilizer and could be moved freely. Investigators established continuity of the elevator control cables to the aft baggage compartment through a series of pullies and runs through lightning holes; the ends of the cables were thermally deteriorated. From the ashen remains of the cockpit, the cables that remained, measuring about 36 in, were traced and found to be attached to their respective cockpit control assemblies. The left inboard half of the horizontal stabilizer and elevator remained attached to the empennage. The outboard section was found about 450 ft upstream in the river. The outboard section of the horizontal stabilizer was deformed aft about 18 in from the leading edge creating an accordion appearance, with the aluminum skin folded over on itself and the boot surface flat. This u-shaped divot that was about 10 inches in diameter. There were several black rub markings and splatter found on the elevator control surface positioned aft of the divot.

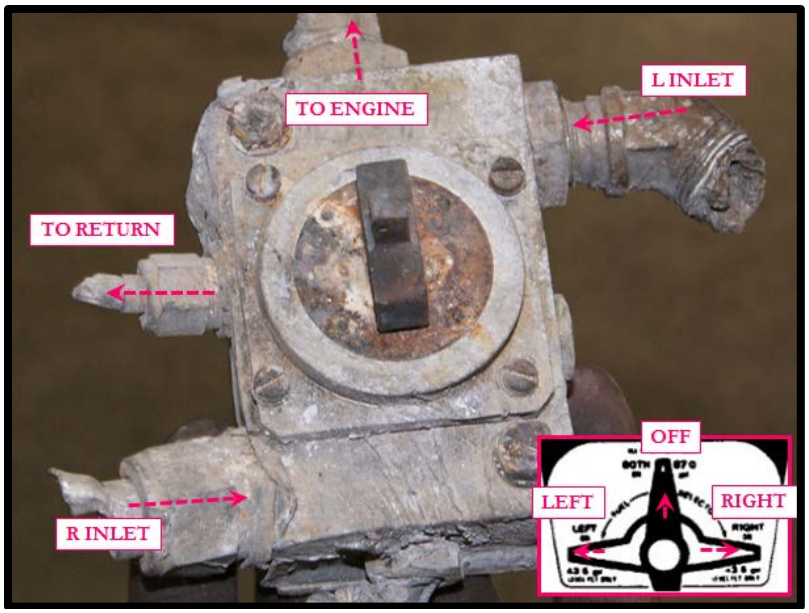


Picture 04: Divot in outboard left horizontal stabilizer and elevator

The elevator trim tab remained attached to the elevator. The elevator trim was observed in a slightly upward position. The rod actuator measured about 1.5 in, which the Cessna representative stated corresponded to a nose-low position. Elevator trim cable continuity was established from the continuous chain where about 18 in of cable was attached to each end and those cables were traced to the thermally deteriorated cockpit.

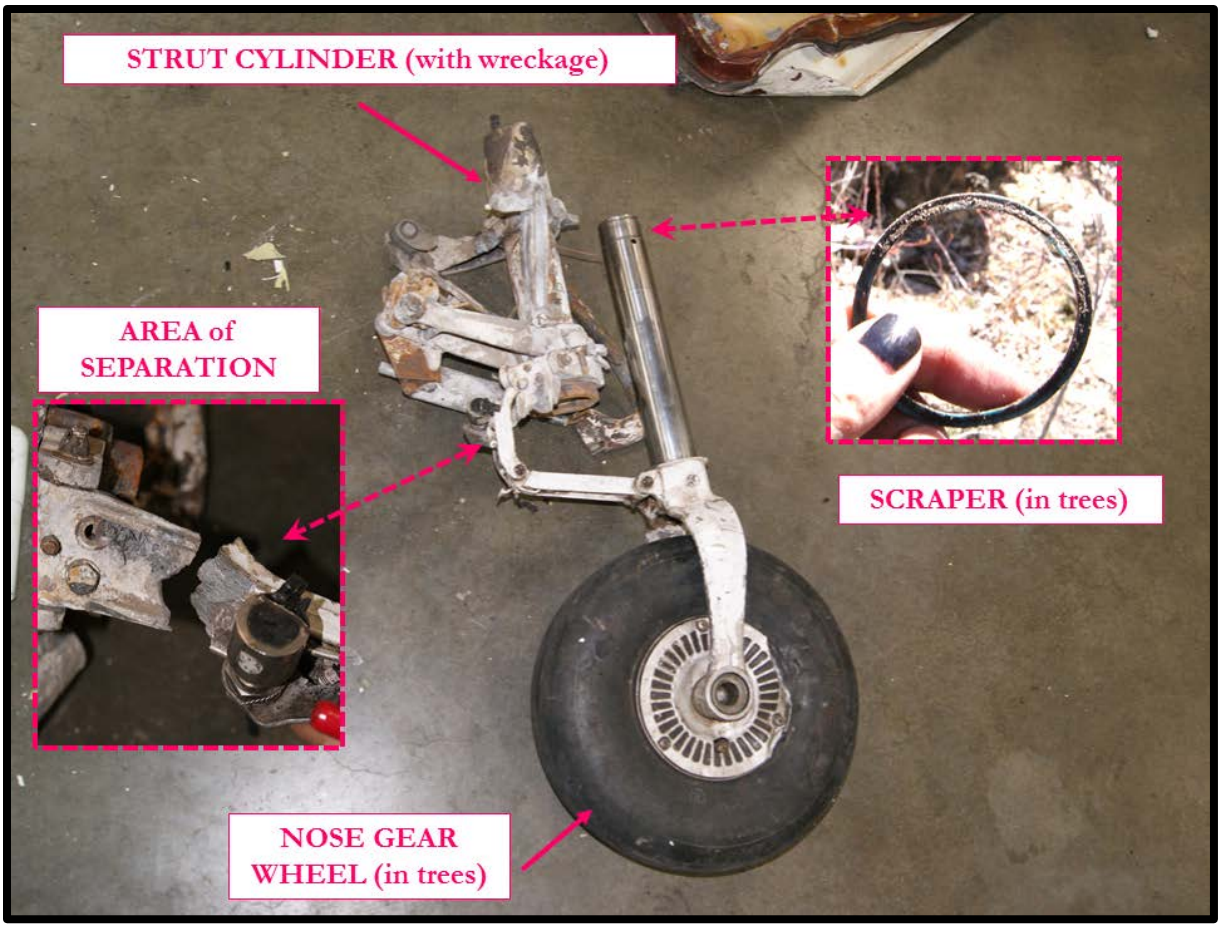
The cockpit gauges were thermally destroyed with only the altimeter providing indications; the needle showed 5,290 feet, and 31.10 was displayed in the Kollsman window.

Fuel system continuity could not be established due to the amount of impact and thermal damage that the airplane had sustained. No fuel was present in either wing tank. The fuel selector valve was found in the "LEFT" position. Trace amounts of fuel were recovered from the fuel manifold and the gascolator.



Picture 05: Fuel Selector

The nose landing gear (NLG) doors were located about 30 ft upstream from the main wreckage. The doors were fragmented and sustained severe crush damage. The NLG wheel was separated at the strut and found near the initial impact. A two inch portion of the rim's flange had fragmented on both sides of the NLG, both approximately 180-degress from one another.



Picture 06: Nose Landing Gear

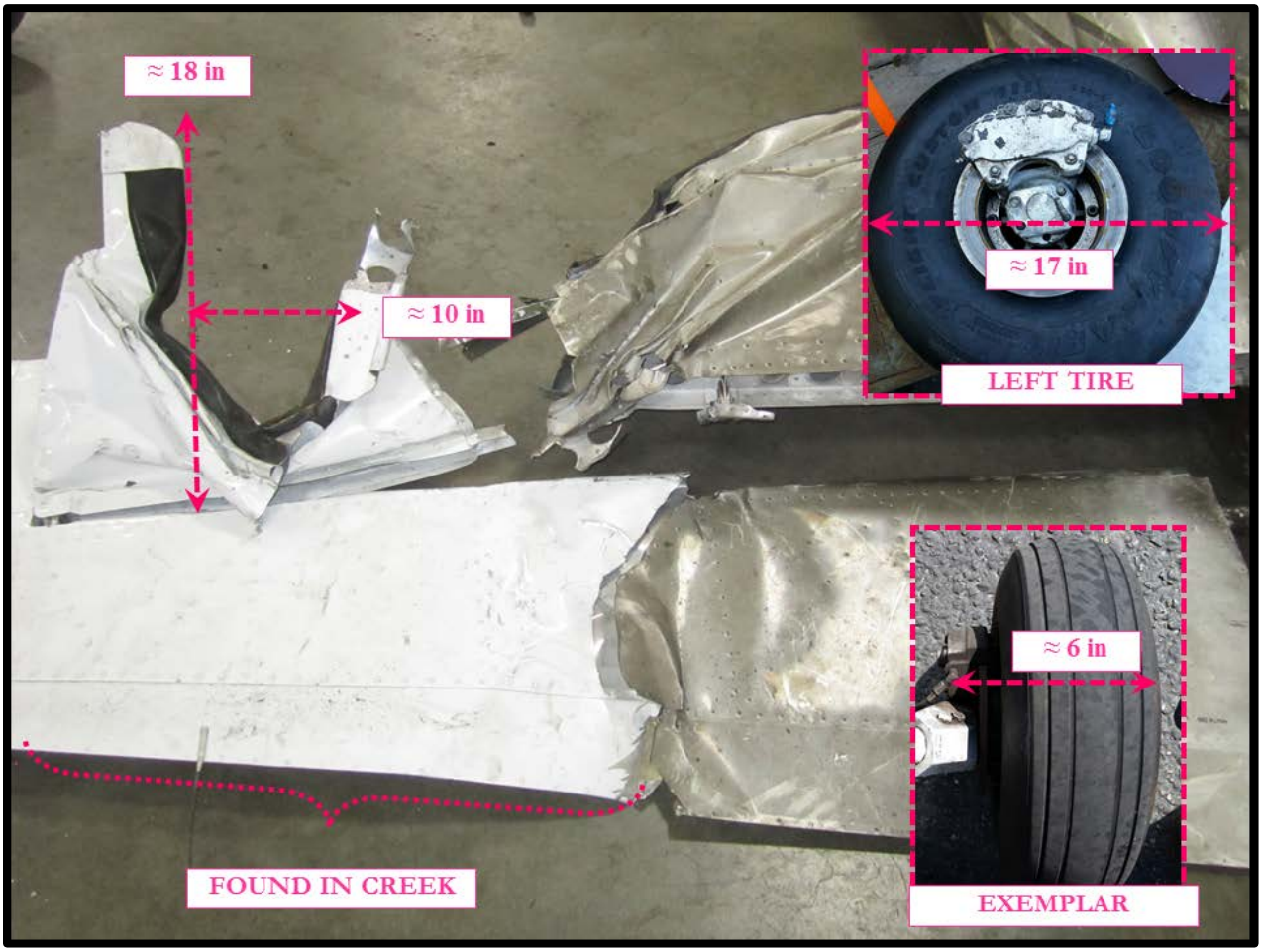
The right main landing gear was found in the wreckage. The gear was locked and the tire/wheel assembly was attached and burned.


Picture 07: Right main Landing Gear

The left main landing gear was found in the wreckage. The gear was unlocked and the tire/wheel assembly was separated. The step was fractured.

Pictures 08 and 09: Left Main Landing Gear

According to the manufacture, Goodyear Aviation Tires, the left main landing gear, (p/n 606C86-6) had an outside diameter between 17.5 and 16.8 in depending on the inflation. The section width was between 6.3 and 5.9 in.



Picture 10: Left Horizontal Stabilizer with Reference to Left Main Landing Gear

The propeller remained attached to the engine crankshaft. All three blade tips remained attached. One blade was twisted to an opposite direction in the hub. The second blade was slight bowed on the outboard foot and was loose in its hub mount. The third blade was bent forward at mid-span and the bent aft the outboard foot. The blades did not display any evidence of chordwise scratching or leading edge dents or dings.

Records Recovered

Last Annual

W/O#: 36U-14-4667 Make: Cessna Model: T210M S/N: 21061884 Reg #: N732YQ	OK3AIR 1980 Airport Rd. Hangar A Heber City, UT 84032	Tach: 3669.4 Total Time: 3669.4 Hobbs: N/A Cycles: N/A SMOH: N/A

I certify that this aircraft has been inspected in accordance with an **Annual Inspection** and was determined to be in airworthy condition. Complied with FAR 91.207(d) by **ELT Inspection** / Function test - No faults found. Battery due: 4/19/2016. Performed the Cockpit Fire Extinguisher Inspection / Weight Check - No faults found.

Complied with the Following Airworthiness Directives:

AD71-09-07 R1, Exhaust System Inspection, C/W IAW Directive Paragraph (a) - No faults found. AD next due @ 3719.4 ACTT.
AD2011-10-09, Pilot / Copilot Seats & Seat Rails, C/W by Inspection and Measurements IAW Directive Paragraph (g)(1) thru (g)(10) - No faults found. AD next due @ 3769.4 ACTT or Dec 2015.

Addressed the Following Discrepancies:

Induction Air Filter Element replaced with new P/N: BA-2405.
Vacuum Regulator Filters LH & RH replaced with new P/N: B3-5-1.
LH Outboard Elevator Static Wick replaced with new P/N: C592001-0201.
LH Outboard Aileron Static Wick replaced with new P/N: C592001-0203.
Missing Baggage Door Bracket, Rod, Ball Joint, & Associated Hardware replaced with new Bracket P/N: 1212123-1, Rod P/N: 1211142-1, Ball Joint P/N: S2104-1, & Associated Hardware.
Serviced Oxygen System as required, and supplied Customer with new Oxygen Cannulas, Lines, & Fittings as requested.
Re-sealed the LH Brake Master Cylinder as needed. Bled & Serviced LH Brake System. Operation / leak check satisfactory.
The Aircraft, Airframe, Aircraft Engine, Propeller, or Appliance identified above was repaired and inspected by OK3Air CRS W77R917Y in accordance with current Federal Aviation Regulations and was Approved for return to service. Pertinent Details are on file under this work order.

Date: 12/8/14 Authorized Inspector: _____ Jeff Dowling

W/O#: 36U-14-4667 Make: TCM Model: TSIO-520-R9B S/N: 294045-R Reg #: N732YQ	OK3AIR 1980 Airport Rd. Hangar A Heber City, UT 84032	Tach: 3669.4 Total Time: 1341.4 Hobbs: N/A Cycles: N/A SMOH: 1341.4

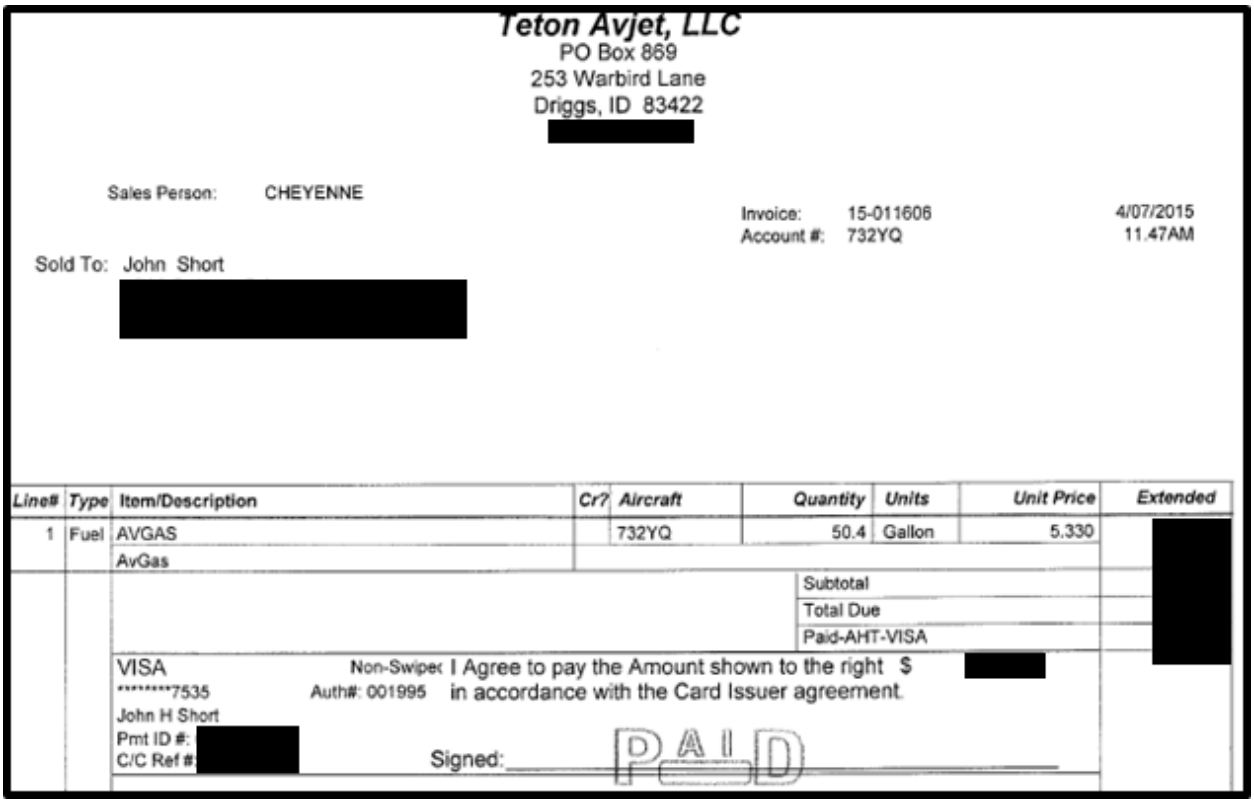
I certify that this engine has been inspected in accordance with a **100-Hour Inspection** and was determined to be in airworthy condition. Performed a Differential Compression Test - #1: 68/80, #2: 67/80, #3: 73/80, #4: 62/80, #5: 68/80, #6: 72/80. Drained the engine oil, and took an oil sample. Installed a new Engine Oil Filter P/N: CH 48109-1, and serviced the engine with 10 quarts of Aeroshell 15W-50 aviation oil. Leak check was satisfactory.

Complied with the Following Airworthiness Directives:

AD2014-05-29, SAP Investment Cast Cylinder Assemblies, does not apply - Superior Air Parts Cylinder Assemblies not installed.
The Aircraft, Airframe, Aircraft Engine, Propeller, or Appliance identified above was repaired and inspected by OK3Air CRS W77R917Y in accordance with current Federal Aviation Regulations and was Approved for return to service. Pertinent Details are on file under this work order.

Date: 12/8/14 Authorized Inspector: _____ Jeff Dowling

Picture 11: Last Annual Inspection



Teton Avjet, LLC
PO Box 869
253 Warbird Lane
Driggs, ID 83422
[redacted]

Sales Person: CHEYENNE

Invoice: 15-011606
Account #: 732YQ

4/07/2015
11.47AM

Sold To: John Short
[redacted]

Line#	Type	Item/Description	Cr?	Aircraft	Quantity	Units	Unit Price	Extended
1	Fuel	AVGAS		732YQ	50.4	Gallon	5.330	[redacted]
		AvGas						

Subtotal [redacted]
Total Due [redacted]
Paid-AHT-VISA [redacted]

VISA Non-Swipe I Agree to pay the Amount shown to the right $ [redacted]
********7535 Auth#: 001995 in accordance with the Card Issuer agreement.
John H Short
Pmt ID #: [redacted]
C/C Ref # [redacted]
Signed: PAID

Picture 12: Last Fueling

The airplane was last fueled at Driggs on April 04, 2015 and topped off with the addition of 50.4 gallons of fuel. According to the line manager at the fueling facility, the airplane was not flown between the fueling and the flight to Upper Loon Creek. The airplane was hangared at their facilities in Driggs, so they would have known if the airplane was flown prior. The JPI unit showed that at the time of the accident, 14 gallons of fuel has been used which is presumably since that fueling.