



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Anchorage Office
December 19, 2018

AIRFRAME AND ENGINE EXAMINATION

ANC18LA064

This document contains 17 embedded photos.

A. ACCIDENT

Location: Iliamna, AK
Date: 08/07/2018
Aircraft: Cessna 207, Registration Number: N7379U, Serial #: 20700427
NTSB IIC: Clint Johnson

B. EXAMINATION PARTICIPANTS:

Clint Johnson
Alaska Regional Chief
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Lisa Jersild
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C. SUMMARY

On August 7, 2018, about 1215 Alaska daylight time, a wheel-equipped Cessna 207 airplane, N7379U, sustained substantial damage during a forced landing, about 1 mile southwest of the Iliamna Airport, Iliamna, Alaska. The airplane was being operated as a visual flight rules (VFR) on-demand cargo/U.S. mail flight under Title 14, CFR Part 135, when the accident occurred. The airplane was registered to, and operated by, Iliamna Air Taxi, Iliamna. The solo airline transport pilot sustained no injuries. Visual meteorological conditions prevailed, and VFR company flight following procedures were in effect. The flight originated at the Iliamna Airport about 1210, and was en route to Kokhanok, Alaska.

D. DETAILS OF THE INVESTIGATION

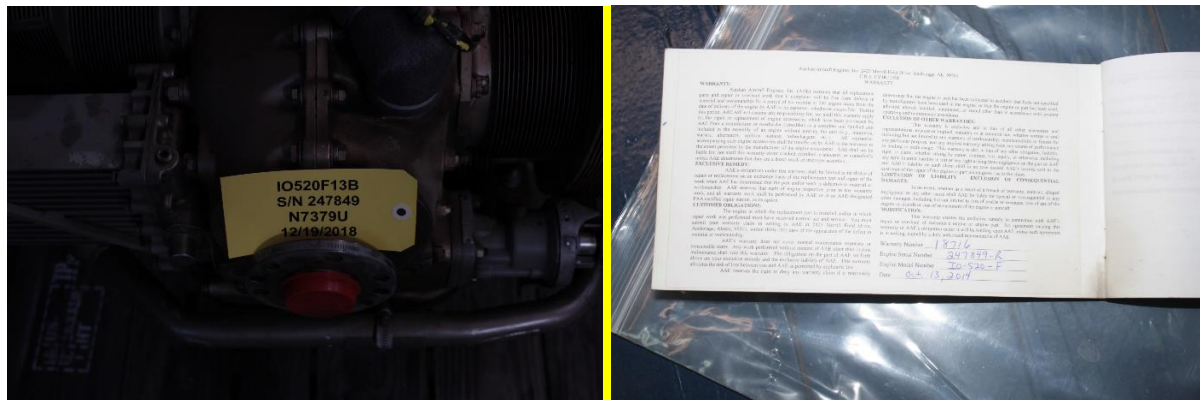
1.0 Description of the Accident:

The pilot reported that after takeoff on runway 35 he started a climbing left turn as he headed towards Kokhanok. He said that as the airplane reached his intended altitude of 1,000 feet mean sea level, and as he began to configure the airplane for cruise flight, the engine began to run rough and lose power, so he elected to immediately return to the Iliamna Airport. He said that he switched fuel tanks and activated the auxiliary fuel pump in an effort to restore full engine power. He noted that the roughness improved momentarily, followed by a severe engine vibration, and complete loss of engine power. The pilot selected a forced landing area on tundra-covered terrain.

1.1 Engine Examination

The engine was shipped to Continental Motors (TCM) for examination in a crate with the log book packaged inside the crate. No shipping damage noted. Engine then removed for examination.

Engine Make : Continental Motors
Model : IO-520-F
Serial # : 247849-R



Engine Specs:

- Minimum Octane Fuel : 100LL
- Oil Grade :
 - o Summer : 100
 - o Winter : 65
- Magneto Time : 22 BTC
- Point Setting : 10 +/-2
- Firing Order : 1-6-3-2-5-4
- Manufacturer recommended overhaul at : 1700 hours / 12 years

Details:

The engine was overhauled in accordance with the manufactures specifications and Alaskan Aircraft Engines, Inc. SB 98-4-1 to Seven Star Specifications 10/13/2014 with a TT 8892.3, TSO 0.

- The engine was installed on the Cessna 207 11/22/2014
 - AFTT : 17,407.5
 - Tach Time : 2764.6
- The engine was removed for shipment to TCM 09/18/2018
 - Tach Time : 3999.2

Lab Notes:

- Engine rotates from propeller flange to rear accessory gear
- Engine compression (thumb) on all cylinders
- Plug:
 - #1
 - Top: carbon fouled (worst)
 - Bottom: carbon fouled (worst)
 - #2
 - Top: lead (not fouled but between insulator and housing)
 - Bottom: carbon
 - #3
 - Top: lead (between insulator and housing)
 - Bottom: carbon
 - #4
 - Top: insulator is fractured
 - Bottom: good
 - #5
 - Top: good
 - Bottom: good
 - #6
 - Top: wore out
 - Bottom: insulator is fractured



- Piston:

#1 : Signs of erosion



#2 : Damaged/failed – detonation / pre ignition



#3 : Signs of erosion



#4 : Mechanical damage, likely #2 cylinder parts that traveled through induction



#5 : Signs of erosion



#6 : Mechanical damage, debris on piston, likely pieces from #2 cylinder



- Cylinder

#1 : Signs of erosion



#2 : Mechanical damage from failed piston, Heli-coil damaged/molten down



#3 : Signs of erosion



#4 : Mechanical damage around top spark plug bay



#5 : Signs of erosion



#6 : Light mechanical damage



- Fuel System
 - Fuel Pump
 - Passed bench test
 - Spider
 - Worked but has small leak in diaphragm
 - Throttle body
 - Was high on pressure, except full open position was in green, (needed small adjustment)
- Oil Pump
 - Oil pressure relief valve had debris, no debris on gears or walls with little to no scoring
- Valves
 - Good, no burning or erosion noted
- Crankshaft
 - #2 connecting rod oil passage had scoring consistent with hard particle passage at some point. No other damage noted.
- Connecting Rods
 - #1 piston rod bushing shifted, #3 piston rod bushing starting to migrate/shift out, not associated with the accident. No other discrepancies noted.
- Magnetos –
 - Mag to engine timing :
 - L at -23
 - R at -25
 - Bench test :
 - L : impulse coupler works in beginning (until reaching 2500rpm) then sticks for the remainder of the time until being freed, spark is good during test and fires in proper sequence.
 - R : impulse coupler works in beginning then sticks for the remainder of the time until being freed, spark is good during test and fires in proper sequence.
- Ignition Leads
 - All in working order
- Oil screen and filter
 - Metallic debris found



- Exhaust stacks
 - no cracks/discrepancies noted

Additional Information:

Pre ignition/detonation from #2 cylinder, possible hot spot/wore out spark plug/Heli-coil damage. Piston failed near bottom plug consistent with damaged Heli-coil and detonation. Further engine notes and report will be provided by Continental Motors.

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Submitted by: Investigator Eric Swenson