



FIELD INVESTIGATION SUMMARY

ACCIDENT

Location: Canadian, Texas
Date: February 15, 2019
Time: 0957 CST
Registration: N421NS
Aircraft: Cessna 421C

PARTICIPANTS

Josh Lindberg
Air Safety Investigator
National Transportation Safety Board

Andrew Hall
Air Safety Investigator
Textron Aviation

Bill Fitzgerald
Inspector
LBB FSDO

Kurt Gibson
Air Safety Investigator
Continental Motors

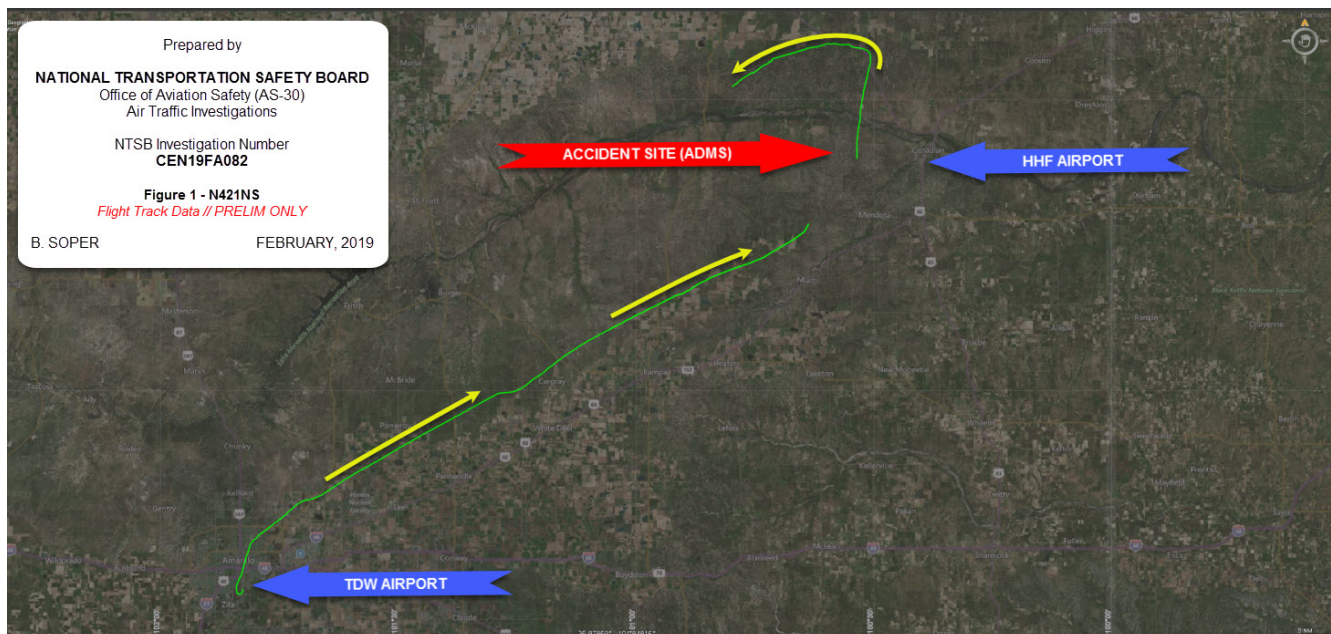
NTSB Accident Number CEN19FA082

HISTORY OF FLIGHT

On February 15, 2019, at 0957 central standard time, a Cessna 421C airplane, N421NS, impacted terrain about 8 miles west of Hemphill County Airport (HHF), Canadian, Texas. The private pilot and one passenger were fatally injured and the airplane was destroyed. The airplane was registered to and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a personal flight. Instrument meteorological conditions prevailed at the time of the accident and no flight plan had been filed. The flight originated from the Tradewind Airport (TDW), Amarillo, Texas at an unknown time.

A witness who was monitoring the HHF common traffic advisory frequency stated that he heard the pilot over the radio and responded. The pilot reportedly inquired about the cloud heights and the witness responded that the clouds were 800 to 1,000 ft above ground level (agl). The witness did not see the airplane in the air.

AIR TRAFFIC CONTROL / RADAR



Track data indicates N421NS likely departed RWY 17 at Tradewinds Airport (TDW) at about 0900 CST making a climbing right turn out to a NNE bound heading until passing through about 5,500' msl, then turning further right to a NE bound heading. The aircraft continued to climb to a cruise altitude of about 7,500' msl and tracked NE bound toward Hemphill Airport (HHF). About 26 nm SW of HHF, the aircraft began to descend until about 13.5 nm SW of HHF when track data was lost at 0921:20 CST, and indicated an altitude of 4,775' msl. At 0925:02 about 6 nm NE of where track data was previously lost, and about 6.5 nm W of HHF, track data resumed and indicated the aircraft was climbing through about 4,650' msl on a NNE heading. The flight track continued NNE bound for about 11 nm then began turning left to a SW bound heading reaching about 6,500' msl, then descending again until track data was lost at 0935:31 CST indicating an altitude of about 4,950' msl and about 20.5 nm NW of HHF, and about 12 nm NW of the accident site as documented in ADMS.

First Track Data: 0900:11 CST // 4,075' msl ---- Last Track Data: 0935:31 CST // 4,950' msl

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The controllers knew the local pilot as he was known to call Amarillo terminal radar approach control (AMA TRACON), on a daily basis. The pilot was initially receiving services from AMA TRACON who transferred him to Albuquerque Center (ZAB) Sector 15. At 0910 ZAB established communications with the pilot and at 0912 a traffic advisory was issued him. At 0920 ZAB terminated service 18.7 miles southwest of HHF.

PERSONNEL INFORMATION

Pilot: Charles S Azzopardi – 75 years old

Ratings: private pilot, airplane MEL, airplane SEL, rotorcraft-helicopter, instrument airplane.

Medical certificate: Issued a second-class medical certificate with no limitations on 07/26/2017.]

Flight hours: reported 5,000 total and 200 hours in last six months as of exam dated 07/02/2015.

AIRCRAFT INFORMATION

Cessna 421C – s/n 421C-0874 – 1980 mfr – current registration

METEOROLOGICAL INFORMATION

METAR KPPA 151535Z 0935 CST 05010KT 4SM BR OVC004 00/M01 A2980 RMK AO2 T10041013

METAR KPPA 151555Z 0955 CST 04012KT 5SM BR OVC004 00/M01 A2981 RMK AO2 T10051015

METAR KHHF 151535Z 0935 CST 03009KT 10SM OVC008 M01/M02 A2985 RMK AO2 T10111024

METAR KHHF 151555Z 0955 CST 04011KT 7SM OVC008 M01/M02 A2985 RMK AO2 T10111022

WRECKAGE AND IMPACT INFORMATION

35.906151° x -100.573641° at elevation 2,564 ft msl

Airframe

The airplane impacted the ground in a nose down attitude with no indications of forward movement. The empennage was displaced to the right. A post impact fire which consumed most of the wreckage. All of the airplane was accounted for at the accident site. The engines were depressed into the soft soil about 2 ft. Both propeller hubs were in the engine craters and all six blades were accounted for at the site. The remains of both ailerons were observed in the appropriate location on the left and right wings. The aileron trim which was measured at 1.2" was beyond the limits of 21° tab up position. The rudder trim was not measured, photographs show the tab displaced slightly to the right of center. Both elevators and the rudder were observed attached to their respective surfaces. The flaps panels were observed slightly extended and the chain wrap was observed to have approximately 8 links on the lower chain which equates to approximately 15° down. The airframe fuel system was compromised by the post impact fire. The first responders told FAA-IIC that they observed the ELT and indicated that the impact damage had displaced the switch guard into the switch and displaced the switch into the off position. The first responders reported that both occupants were utilizing only the lap belt portion of the 3-point restraint system. All of the cockpit was severely compromised by the post impact fire and no instrument or devices were recovered.

Left Engine/Propellers

Engine Model: GTSIO-520-L Engine S/N: 292352-R Engine Assembly Date: 10/06/1998 Engine Spec BHP: 375 BHP at 3350 crankshaft RPM.

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Engine sustained a significant amount of impact and thermal damage. The crankcase that houses the gearbox had broken free from the rest of the crankcase. All six cylinders remained attached to the engine and displayed varying amounts of impact damage. All of the fuel, ignition, turbocharger, and accessory components displayed varying amounts of thermal and impact damage.

The crankcase displayed a significant amount of impact damage signatures; the gearbox housing had broken free from the rest of the crankcase. The crankcase also displayed thermal damage signatures. There were no signs of a catastrophic internal engine failure noted. The propeller flange remained attached to the propeller shaft and displayed impact damage signatures. The rear of the propeller shaft was partially visible through the broken crankcase; there were no anomalies noted with the visible portion of the propeller shaft. The reduction gear was partially visible through the broken crankcase. There were no anomalies noted with the visible portion of the gear. The quill shaft displayed impact damage signatures and had broken into two pieces. It was noted that on one of the ends of the quill shaft there were cracks noted at an approximate 45° angle. Attempts to rotate the crankshaft were unsuccessful which was consistent with the extensive impact damage to the engine. The front portion of the crankshaft was visible through the broken crankshaft and displayed impact damage. The crankshaft gear was visible after removing the starter adapter; the gear remained intact and displayed thermal damage. It was noted that the crankshaft and camshaft timing was correct. Small portions of the crankshaft were visible by using a lighted borescope inserted into drilled holes in the crankcase; there were no anomalies noted with the visible portions of the crankshaft and it was noted that all six connecting rods remained attached to their journals and there were no signs of thermal distress to any of the connecting rods. The connecting rods were inspected using a lighted borescope inserted into drilled holes in the crankcase. The connecting rods remained attached to their journals; there were no signs of lubrication distress to any of the rods. The forward portion of the camshaft was visible through the broken crankcase; the end of the camshaft had broken free from the rest of the camshaft consistent with impact damage. Portions of the camshaft were visible with a lighted borescope inserted into the crankcase; the visible portions displayed normal operating signatures. All six cylinders remained attached to their cylinder bays and displayed varying amounts of impact and thermal damage. The cylinders were inspected using a lighted borescope; the piston faces, cylinder bores, and valve heads displayed normal operating and combustion signatures. The overhead components displayed thermal damage signatures and normal operating signatures; the rocker arms and valves were capable of movement when manually actuated. The magnetos had broken free from their installation points and displayed a significant amount of thermal damage and some impact damage. The magneto housings were almost completely destroyed by thermal damage and the internal components were also almost completely destroyed by thermal forces. The harness displayed significant impact and thermal damage signatures. The top spark plugs were removed and the electrodes were visually inspected. The electrodes displayed normal operating and wear signatures. The bottom spark plugs were inspected using a lighted borescope; several of the spark plug electrodes were submersed in water/oil, the visible electrodes displayed normal operating signatures. The fuel pump had broken free from its installation point and displayed a significant amount of impact and thermal damage. The fuel pump drive shaft and gear were noted to be intact. The recovered portions of the fuel pump displayed normal operating signatures. The throttle and metering assembly displayed a significant amount of impact and thermal damage signatures; the fuel metering assembly had broken free from the rest of the assembly and was not recovered. The throttle body and valve displayed thermal and impact damage signatures as well as normal operating signatures. The fuel manifold valve displayed a significant amount of thermal damage signatures; the fuel manifold top housing had partially melted away. The internal components displayed thermal damage signatures. The nozzles displayed a varying amount of impact damage signatures. There were no signs of fuel leaks noted around the nozzles. The oil pump had broken free from the engine and displayed significant impact damage signatures. The drive shaft had broken consistent with impact damage. There were no anomalies noted. The oil cooler remained attached to the engine and displayed impact and thermal damage signatures. The oil sump displayed a significant amount of impact damage; the oil sump was breached and was crushed upwards. The oil pick-up tube and screen were visible through the broken oil sump; the screen contained debris consistent with dirt; there was

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no metallic material noted within the screen. The remote oil filter remained partially attached to the adapter and displayed a significant amount of impact damage; due to the damage the oil filter could not be removed. The turbo displayed impact and thermal damage signatures and was unable to rotate. The V-band clamps were noted to have remained attached to the turbocharger turbine section. The controller had broken free from its installation point and displayed significant impact and thermal damage. Wastegate remained attached to engine and displayed impact and thermal damage. The overboost valve had broken free and displayed significant impact damage signatures. The propeller governor remained partially attached to its installation point and displayed impact damage signatures. The propeller hub had broken free from the propeller shaft and all three propeller blades displayed impact damage signatures in the forms of bending, twisting, gouges, and chordwise scratches. All three of the left propeller blades were observed separated from the engine. One blade marked "A" remained attached to the propeller hub and piston dome. One blade remained attached to a section of the hub and the other blade was observed separated completely. Blade "A" did not exhibit much chord wise scratching of the blade and it did have a section of the trailing edge missing near the tip. Blade "B" exhibited "S" bending and chord wise polishing of the cambered side of the blade. Blade "C" was observed with a slight forward bend and some twisting with chordwise scratching of the cambered side of the blade.

Right Engine/Propellers

Engine Model: GTSIO-520-McL Engine S/N: 823573-R Engine Assembly Date: 02/14/2003 Engine Spec BHP: 375 BHP at 3350 Crankshaft RPM. The engine displayed a significant amount of impact and thermal damage signatures. All six cylinders remained attached to the engine and displayed varying amounts of impact damage signatures. The propeller hub remained partially attached to the propeller flange and one propeller blade remained within the attached portion of the hub. All of the engine components displayed varying amounts of thermal and impact damage signatures. The crankcase remained intact and displayed a significant amount of impact damage concentrated to the forward and bottom portion of the crankcase. The crankcase did not display any signs of a catastrophic internal engine failure. The propeller shaft remained intact and displayed impact damage in the form of bending. The reduction gear shaft was partially visible through the alternator attach point; the gear was impacted with mud and dirt; the visible gears were intact and displayed normal operating signatures. The crankshaft gear was visible at the rear of the crankcase and was intact and properly secured. The crankshaft/reduction gear/propeller shaft were unable to be rotated which was consistent with the extensive impact damage. Small portions of the crankshaft were visible by using a lighted borescope inserted into holes drilled into the crankcase; the visible portions displayed normal operating signatures and it was noted that all six connecting rods remained attached to their journals. The connecting rods were inspected using a lighted borescope inserted into drilled holes in the crankcase. The connecting rods displayed normal operating signatures and there were no signs of lubrication distress to any of the rods. All six cylinders remained attached to their cylinder bays and displayed varying amounts of impact damage. The cylinders were inspected using a lighted borescope; the piston face, cylinder bores, and valve heads displayed normal operating and combustion signatures. The overhead components displayed normal operating and lubrication signatures and the valves and rocker arms were capable of movement when actuated manually. The magnetos had broken free from their installation points and displayed impact and thermal damage signatures. The left magneto drive was capable of only rotating a few degrees; the magneto was partially disassembled and the internal components displayed significant thermal damage; the magneto drive was capable of rotating a few degrees and it was noted that both gears moved. The right magneto displayed minor thermal damage signatures and the drive was capable of rotation; however, the plastic distributor gear was noted to not rotate. The magneto was disassembled and the distributor gear was noted to have 3 broken teeth located where the metal drive gear meet; the damage was consistent with impact damage; there were no signs the magneto operated with the broken teeth. The harness displayed significant impact damage signatures and some thermal damage. The top spark plugs were removed; the electrodes displayed normal operating and wear signatures. The bottom spark plugs were inspected using a lighted borescope; several of the electrodes were

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submersed in oil. The visible electrodes displayed normal operating signatures. A large portion of the fuel pump had broken free from the engine and displayed impact damage signatures. The drive shaft and gear were noted to have remained intact. The fuel pump was disassembled and the internal components displayed impact damage signatures and normal operating signatures. The throttle and metering assembly displayed impact and thermal damage signatures; the metering assembly had broken free from the throttle body. The fuel inlet screen was removed and was noted to be no blocked. The manifold valve remained attached to the engine and displayed a significant amount of impact damage; the valve top cap had broken free and the spring was not located. The internal components displayed impact damage and a significant amount of dirt was located in the valve. The nozzles displayed varying amounts of impact damage signatures. There were no signs of fuel leaks around any of the nozzles. The oil pump had broken free from the engine and displayed impact damage signatures; it was noted that the drive shaft was bent and had partially broken free. The oil sump displayed a significant amount of impact damage; the sump was crushed upwards. The oil filter had broken free from the adapter and was noted located at the time of the examination. The turbocharger remained attached to the airframe and displayed impact and thermal damage signatures. It was noted that the V-band clamp remained attached to the tailpipe. The turbine and compressor displayed normal operating signatures and were unable to be rotated. The controller had broken free from its installation point and displayed impact damage signatures. The wastegate had broken free from its installation point and displayed impact and thermal damage signatures. The overboost valve remained attached to its installation point and displayed impact and thermal damage signatures. The propeller governor displayed a significant amount of impact damage; the housing was partially destroyed and the internal components were also partially destroyed. A portion of the propeller hub and one propeller remained attached to the propeller shaft; the other two propeller blades and the rest of the hub had broken free. All three propeller blades displayed impact damage signatures in the forms of bending, twisting, polishing, and chordwise scratches. The right propeller hub remained partially attached to the engine with one propeller blade marked "A" exhibited some "S" bending along the trailing edge. Blade "A" was observed loose in the hub, which was attached to the engine. Blade "B" exhibited some chordwise polishing of the leading edge and cambered surface. There was some twisting of the blade observed. This blade remained attached to a large section of the hub which contained the propeller piston which had the spring retained. Blade "C" was observed separated from the hub and exhibited a bend towards the flat side of the approximately 12" out from the hub. This blade exhibited heavy chordwise polishing of the cambered side of the blade.

DRONE MAPPING

The NTSB IIC used a DJI Phantom 4 Advances sUAS to photograph the accident scene. The photos were used in the Pix4D software to generate a Google Earth tile. The images could be used for additional mapping and/or 3D modeling of the accident site.