



RECORD OF CONVERSATION

Timothy W. Monville
Sr. Air Safety Investigator
Eastern Region

Date: November 8, 2018
Person Contacted: Daniel S. Beard
NTSB Accident Number: ERA19LA032

Narrative:

Mr. Beard was contacted by phone on November 8, 2018, at 1216 EST. He was called at [REDACTED]
[REDACTED] His e-mail address is [REDACTED]

At the beginning of the call he was advised that the NTSB is a federal agency mandated by Congress to investigate aircraft accidents, and NTSB has no authority to take any action against any individual. He was also informed that the purpose of an NTSB investigation is for safety only, and any person NTSB talks with has the right to representation; he agreed to the interview without representation.

He advised that the airplane was built by David Fowler, and was asked to discuss this later in the day. It was agreed for NTSB to call him back the same day between 1530 and 1545 EST.

He was called at the same phone number on the same day at 1541 EST.

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He advised that the airplane was in a test period (Phase 1 Operating Limitations) requiring 40 hours. The specific purpose of the flight was a test flight, to verify that engine operating temperatures and pressures were good. He specifically mentioned that he planned to monitor the high pressure fuel pump due to recent replacement. He was the only person who had flown the airplane, operating it on 7 or 8 flights spanning about 10 hours. He has a total time of about

10,000 hours, which includes tailwheel, and high performance airplanes. He holds a flight instructor certificate, and is current.

He was asked if he was medicated and he reported he was taking Lortab (which contains acetaminophen and hydrocodone). His last dose was at 1300 hours EST on 11/8/2018, which he takes every 6 hours as needed for pain due to his injury sustained in the accident. He reported that he felt clear headed enough for the interview.

The airplane was a 3/4 scale replica of the P-51 Mustang, based at the Valkaria Airport (X59), Valkaria, Florida. It was a tandem airplane in which solo flight is from the front seat, with a four-place restraint. It was equipped with a Honda J35 six cylinder engine, with a reduction gearbox for the four-bladed constant speed propeller. A fuel tank with sump drain was installed in each wing near the wing root, bringing the total capacity to 15 gallons. A low point drain is installed before the firewall. Each wing fuel tank fed into a header tank, which was equipped with a shutoff valve. The airplane was also equipped with auxiliary fuel tanks at each wingtip, but they were never used. It was a conventional gear airplane with retractable main and tail wheel. It was equipped with an electronic ignition and dual airplane batteries. With respect to the fuel system, it was equipped with a low pressure auxiliary fuel pump, and two high pressure auxiliary fuel pumps in parallel; only 1 high pressure pump is required for takeoff.

As a result of fuel pressure fluctuation during his last flight, the owner/builder replaced one high pressure fuel pump. Because of that, he intended to orbit X59 while monitoring pressures and temperatures.

In advance of the local flight, the airplane owner/builder who is not a pilot fueled the airplane and took samples of fuel from each fuel tank. As part of his preflight, the owner showed him the samples that were taken and no contaminants or particulate matter was noted. The airplane was fueled with Mogas, or ethanol free automobile fuel. He also checked the flight controls and fluid levels. After the engine was started, he had a long warm-up due to the long taxi to runway 28, noting all temperatures and pressures were good. Prior to takeoff wearing the 4-point harness snug, he performed a "high power" engine-run noting the temperatures and pressures were normal, or in the green arc. The run-up also included cycling of the constant speed propeller.

He departed from runway 28 (runway in use) with the flaps retracted, 15 gallons of fuel, the shutoff valve on, and 1 high pressure and the low pressure fuel pumps on. At about 300 feet but no higher than 500 feet, after retracting the landing gear, he noted the engine surge, and saw the fuel pressure fluctuating, which was similar to what occurred during his previous flight. Since the engine was still developing partial power, he initiated a right turn to land on runway 14, but when nearly done with the turn, or on a close right base leg of the airport traffic pattern for runway 14, the engine lost total power. He also noticed a "puff" of white smoke from the right exhaust stack. While in a slight right wing low, nose-up attitude, with the flaps and landing gear retracted, the airplane impacted a very small pond and came to rest partially in the water and partially on the bank of the pond. He reported no issues getting out of the restraint, exited the airplane, and was transported by ground ambulance to the Health First Palm Bay Hospital in Palm Bay, Florida, and was treated for his injuries. He estimated the total flight was about 3 minutes from takeoff power to the accident.

As a result of the impact, the right wing and propeller spinner separated. The propeller also separated from the engine. The airplane was recovered by the builder and taken to his hangar at X59. He did not think the engine was submerged, but reported it was partially separated.

His injuries include a laceration to his forehead, a fractured right ankle which required surgery, and bruises.

The digest was e-mailed to him for review on November 8, 2018. He replied on November 9, 2018, at 0603 EST with, "Good morning Mr [Monville], Your draft notes are correct and complete to the best of my recollection except for one correction. The Health First Palm Bay Hospital is located in Palm Bay Florida. It is affiliated with the Health First Holmes Regional Medical Center in Melbourne, but Health First Palm Bay Hospital is located in the city of Palm Bay. V/R, Dan." The correction was made to the digest.



RECORD OF CONVERSATION

Timothy W. Monville
Sr. Air Safety Investigator
Eastern Region

Date: April 6, 2020
Person Contacted: Dave Fowler
NTSB Accident Number: ERA19LA032

Narrative:

Mr. Dave Fowler was contacted by phone on March 21, 2019, at 0828 EDT. He was called at [REDACTED]

His airplane was equipped with a Simple Digital Systems (SDS) EM-4/EM-5 system that is an electronic ignition system that regulates both timing and fuel delivery. His airplane was operated using 90 Octane racing fuel. It was equipped with water temperature, and exhaust gas temperature indications but was not equipped with cylinder head temperature (CHT) indication. The normal takeoff rpm was between 4,800 and 4,900 rpm. As part of setting up the engine parameters he indicated that nobody agreed as to what numbers to set up. After setting up his airplane, he reported having a previous engine overheating issue. He provided the name Ron Daling of Titan. His phone is [REDACTED]. The accident engine had about 25 hours on it, of which 20 were accrued during ground testing.

His airplane received the airworthiness certificate from designated airworthiness representative (DAR) Jim Auman.

He indicated that he witnessed the takeoff and saw smoke trailing the airplane when it went over his position. At that time the airplane was between 400 and 500 ft. He reported there was a continuous trail of white smoke with equal spacing of black smoke.

As part of the engine examination that took place about 2 weeks earlier and was witnessed by FAA inspector King, the valve clearances were checked on all cylinders and all were within limits except for the No. 1 cylinder. The cylinder heads were removed and the pistons for the 2 center cylinders (Nos. 2 and 5) were damaged. The No. 2 cylinder piston started to burn through, while the No. 5 cylinder piston had burned through. All six pistons showed over temperature signatures except the No. 1 cylinder.

He took the fuel system apart and did not find any issues. The fuel system components he checked still had fuel. He did not find any issues with the high or low pressure fuel pumps, adding that his system consists of a common fuel rail. During the engine examination they found no issues with the lubrication system; all bearings had adequate lubrication.

As part of his investigation he spoke with the DAR who indicated that the Honda engine was equipped with cast pistons, which were designed for 1,800 to 2,000 rpm, and not the nearly 5,000 rpm they were operating at for takeoff. Also, Mr. Auman took possession of the EM4/EM-5 which was sent to the manufacture's facility in Canada and no issues were identified.

The following action items were requested or verified during the call:

1. Statement from him regarding his engine examination findings
2. He confirmed FAA inspector Cheryl King was present during the engine examination
3. He was requested for data downloaded from the EM-4/EM-5

The digest was e-mailed to him for review on April 6, 2020. He replied on April 7, 2020, at 1047 EDT with comments that were incorporated into the narrative. The corrected digest was e-mailed to him on April 7, 2020.



RECORD OF CONVERSATION

Timothy W. Monville
Sr. Air Safety Investigator
Eastern Region

Date: April 16, 2020
Person Contacted: John Williams
NTSB Accident Number: ERA19LA032

Narrative:

Mr. John Williams, President of Titan Aircraft (airplane designer) was contacted by phone on April 16, 2020, at 1312 EDT. He was called at [REDACTED] His e-mail address is [REDACTED]

He was called to ask if he had reviewed the data downloaded from the engine computer and also looked at the pictures of the damaged pistons that were e-mailed to him on April 6, 2020, at 1445 EDT. He indicated that he had looked at the provided information and that based on his experience, the damage to the pistons was not caused by detonation, rather, it was caused by water intrusion from a warped cylinder head. The warped cylinder head can be caused by trapped air in the cooling system that is not properly evacuated, which results in hot spots, and subsequent overheating. Although he did not communicate directly with the airplane owner regarding on-going issues with his airplane, he did communicate postaccident with individuals involved with the airplane and was informed that they were having a problem with engine overheating.¹ He advised Honda vacuums the coolant system to eliminate all air when servicing the cooling system.

He offered to disseminate a service bulletin (SB) to owner's advising them of the need to properly evacuate the cooling system for air, suggesting the use of a vacuum.

With respect to the data points downloaded in the engine computer, he did examine the data and noticed that it was a "standard program" which was set up for use with 100 low lead fuel. And it should not have been set up using automotive fuel (mogas). In this regard he also will

¹ The airplane owner reported to NTSB on March 21, 2019, having previous engine overheating issues. Please see NTSB Record of Conversations in the NTSB's public docket for this investigation.

disseminate a SB advising owners the need to properly set up the computer for the type of fuel used. While he did say that the values in the engine computer could cause detonation, the damage he saw in the pistons was consistent with water intrusion and not detonation.

Further, he added that he had an incident involving a warped cylinder head. In his instance that occurred at Oshkosk, after takeoff he smelled something that made him think he had an electrical fire in the cockpit shortly after takeoff. He alerted the controller that he wanted to return and landed uneventfully. During a postevent inspection they found the warped cylinder head which caused oil to contact the exhaust.

When asked if he had any known instances of water intrusion into a cylinder, he became aware of an event in New Zealand. In that instance he was sent pictures. He was asked to send copies of the pictures and he advised he would look for them.²

The digest was e-mailed to him for review on April 16, 2020. An employee of his company replied on April 20, 2020, at 1230 EDT with, “he reviewed the write up and everything looked good.”

² The pictures were provided on April 20, 2020, at 1222 EDT.



RECORD OF CONVERSATION

Timothy W. Monville
Sr. Air Safety Investigator
Eastern Region

Date: April 24, 2020

Person Contacted: [REDACTED] Owner of Similar Airplane with Same Engine

NTSB Accident Number: ERA19LA032

Narrative:

Mr. [REDACTED] owner of N [REDACTED] was contacted by phone of April 23, 2020, at 2043 EDT. He was called at [REDACTED] and left a voice mail message. He returned the call the same day at 2104 EDT, from the same phone number. He provided an e-mail address of [REDACTED]

He was advised that I am the NTSB investigator-in-charge concerning an accident involving a Titan T-51 and wanted information from him about his airplane, also a Titan T-51. He confirmed it was equipped with a Honda J35 A6 engine which was from a 2005 Honda Pilot vehicle, and he built the airplane which took about 4.5 years. His airplane was equipped with dual Simple Digital System (SDS) 4.

Since completing the build, he indicated that he had 4 separate instances of damage to the No. 6 piston, the first of which occurred during the very first flight in the airplane. On that flight which was planned to be flown once around the airport traffic pattern with the landing gear down, after takeoff the engine "burbled." And on the downwind leg of the airport traffic pattern a witness on the ground (planned) noted smoke trailing the airplane, which he saw coming out of the exhaust. He landed uneventfully adding that the flight was only 3 to 4 minutes and taxied to the ramp. During examination of the engine following the first and subsequent 3 piston damage events, he described the damage to the piston as being a hole down the side of it. In all cases Titan provided an engine replacement or replacement engine parts. He also indicated that he actually had another engine issue that he described as catastrophic. That event involved an off airport forced landing following total loss of engine power. Post event inspection of the engine revealed a hole in the engine crankcase. At the time of all 5 engine events he was operating the engine using the programmed engine values that were provided by Titan.

Due to the continuing piston issues, he eventually contacted SDS and their initial opinion of the engine programming was that there was too much timing and not enough fuel. He worked with SDS to determine engine values that did not cause piston damage, which included numerous flight tests and relaying of engine parameters to SDS. Finally, they arrived at values which were tested for 50 hours with his engine normally aspirated equipped with cast aluminum pistons (similar to the accident airplane), and another 50 hours with his engine supercharged and equipped with forged pistons. He subsequently has operated his airplane for about another 100 hours with no engine issues noted. He attributed this to the new engine programming that was performed.

He noted that the exhaust gas temperature (EGT) readings had previously been “always high.” He was informed that 1,450° F was acceptable, but have since learned that automobile engines like his Honda engine should have the EGT no higher than 1,250°F. On a hot day at the airport he operates out of which has a field elevation of 5,000 ft, with the new engine programming, he normally sees EGT readings between 1,200°F and 1,250°F during takeoff, which decreased with power reduction.

He was asked what type of fuel he utilized and he indicated that he normally uses 100LL fuel but have used 87 and 91 Octane fuel when available. With respect to the fuel used he was asked if he had the adjust the fuel programming when using other than 100LL. He indicated that it does require minor tweaking which he does from a control in the cockpit. By turning the control, it adjusts the fuel schedule.

He was asked to provide any pictures showing the piston damage. He advised he would look for them.

The digest was e-mailed to him for review on April 24, 2020. He replied the same day at 1054 EDT with comments that were incorporated into the narrative. The corrected digest was e-mailed to him on April on 24, 2020.