

Stein Stephen

From: Bill Werth [REDACTED]
Sent: Monday, May 04, 2015 8:54 PM
To: Stein Stephen
Subject: RE: 6120 for N34BJ/Billy Werth Airshows/Billy Werth

Hey Stephen, good afternoon. The main tank holds 27, and since the flop tube extends to the bottom of the tank, there should only be a gallon at the most of unusable fuel, maybe less. The seat tank had all 13 usable, and the wing tank had 10 usable.

I'd rather be flying...upside down!!
Maj Billy Werth
Billy Werth Airshows, LLC
Grayout Aerosports, LLC
[REDACTED]

From: Stein Stephen [REDACTED]
Sent: Monday, May 4, 2015 1:12 PM
To: Bill Werth
Subject: RE: 6120 for N34BJ/Billy Werth Airshows/Billy Werth

Billy – how much unusable fuel is there for each of the three tanks?

From: Bill Werth [REDACTED]
Sent: Friday, May 01, 2015 5:47 PM
To: Stein Stephen
Subject: RE: 6120 for N34BJ/Billy Werth Airshows/Billy Werth

Hey Stephen, thanks for the email. Yeah, there was occasionally a problem with the fuel from the wing tank draining down to the main tank. It was very sporadic as to the frequency. Sometimes it would work fine, sometimes it would drain really slow, and sometimes it didn't seem to drain at all. Honestly, I didn't really count on it working because of the unreliability of it, and just kept fuel in there as a back up. All my fuel calculations to any destination didn't include that fuel, just in case it didn't work at all. My assumption was that it was a venting problem. The vent line was either clogged, or maybe not big enough??... Again, that's a complete guess by me, I'm not an A&P. Even that morning, departing Frenchville, our first fuel stop was right at 2 hours away. At the 15 gal per hour I was burning, I would've used 30 gallons. The main has 27 gal, and the seat tank that I ran dry had 13. That should've had me landing with somewhere between 8 and 11 gallons left in the main tank. And that is not accounting for the top wing tank fuel.

You finding anything that makes sense so far?

I'd rather be flying...upside down!!
Maj Billy Werth
Billy Werth Airshows, LLC
Grayout Aerosports, LLC
[REDACTED]

From: Stein Stephen [REDACTED]
Sent: Friday, May 1, 2015 4:16 PM
To: Bill Werth
Subject: RE: 6120 for N34BJ/Billy Werth Airshows/Billy Werth

Hi Billy,

I'm working on the factual report now. I understand you had some prior issues getting the top wing tank to flow into the main tank. Can you explain how frequently you would have this problem? And what you think the problem may have stemmed from?

Thanks,

Stephen

From: Bill Werth [REDACTED]
Sent: Wednesday, August 20, 2014 1:03 AM
To: Stein Stephen
Subject: 6120 for N34BJ/Billy Werth Airshows/Billy Werth

Good morning, Stephen. Here is the 6120 form. Please let me know if I need to make any corrections on there or if something doesn't make sense. (or if I need to actually sign and scan a copy of the last page to get to you) I'll be sending out the logbooks this morning, and I'll put the Airworthiness and the Registration in with the logbooks, also. I can't imagine I'll need those for the time being and the FAA can send those back when they're done, too. Thanks again for your assistance and your patience with all of this. I appreciate the help.

Billy Werth
[REDACTED]

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Stein Stephen

From: Bill Werth <[REDACTED]>
Sent: Tuesday, September 02, 2014 6:41 AM
To: Stein Stephen
Subject: Fuel schematic for N34BJ
Attachments: Billy Werth Schematic Fuels.jpg

Good morning, Stephen! Hope you had a great Labor day. Here's a rough schematic of the fuel system for the Eagle. If you have any questions about that, feel free to let me know.

Also, you had asked about the flight up to the point where the engine quit. Up to that point the flight was very normal. No rough running engine, or anything out of the ordinary. Here's how the fuel burn sequence went for that flight:

Departed KFVE with 51 gal on board (full fuel in all tanks). The folks there serviced the aircraft with 32 gal prior to departing, which means I had 19 gal already in the aircraft, which was what I had estimated remaining after the performance on Sunday. After takeoff, I climbed to 4500ft msl in formation with Bill Gordon. The climb took about 5-8 minutes and was burning around 18-20 gal an hour at that power setting. Once I leveled off, I leaned the power back to about a 15 gal per hour fuel burn. I put the total fuel in the totalizer (the Grand Rapids Engine Information System) and it calculates my fuel burn and remaining gallons. I use 47 as my total which leaves me about a 5 gal pad. After takeoff, I burned 10 gal out of the main tank, leaving 17 gal which is plenty of room to drain the top tank's 10 gal into during the rest of the flight. Once I burned the 10 gal out of the main, I switched tanks to burn fuel out of the seat tank. I burn that 14 gal until it runs out, then switch back to the main tank. I started burning the seat tank at about 35 minutes into the flight. I burned the seat tank until around the 1:25 point in the flight. The seat tank was then dry and I switched back to the main tank. At that point, the main tank should've had either 17 gal (from the previous fuel sequence) or 27 gal (assuming the top tank drained completely...which it occasionally would NOT do). The rest of the flight up to the engine failure, which was approximately 30 minutes, was also normal. I remember seeing 1:53 on the flight timer as the engine quit. When Bill Gordon called me on the ground in Sanford, he stated that he put 28 gal in his aircraft.

So here's the multiple calculations for the fuel on board:

1. Flying for 1:53 at a fuel burn of 15 gal/hr would use approx. 30 gallons. If I start with the actual gallons in the aircraft of 51, that leaves 21 left in the main. (10 in the main if the top tank didn't drain)
2. Using the underestimated amount of 47, that leaves 17 left in the main (or 7 remaining if the top tank didn't drain). Which I would've seen as the fuel bubble on the sight gauge shows up at around 9 gal remaining in the main tank. I never saw the fuel bubble below the 9 gal point which is where I can start to see it.
3. If I used the same amount of fuel as Bill Gordon, I would've had 23 left in the main tank (13 if the top didn't drain).

I hope that helps put some of the pieces together for this. You mentioned there may not be a 'smoking gun' really, which I understand. From what I've heard from other guys in the airshow community, I've got a few places we could look at:

1. The fuel servo (I guess if the needle valve migrates out of position, it can shut fuel off right at the servo).
2. The engine driven fuel pump (if the by pass didn't work, it would've shut off fuel)
3. The flop tube in the tank (if it became stiff, or actually came off, you now have 0 gal left at the point where the tube enters the tank)

If I hear of any others, I'll let you know, but that's all I've heard of so far. Thanks again for all the help with this. Like usual, please feel free to contact me if you have any questions about any of this info. Cell is totally fine, as that is usually a little quicker.

I'd rather be flying...upside down!!

Maj Billy Werth

Billy Werth Airshows, LLC

Grayout Aerosports, LLC



Stein Stephen

From: David Fernald [REDACTED]
Sent: Friday, October 03, 2014 5:52 PM
To: Stein Stephen; David Fernald
Subject: Re: NTSB Investigation - N34BJ

Stephen,

We do not as a matter of practice perform a white bucket test daily. The fuel dispensed into Bill Werth's aircraft was from a 500 gallon AVGAS refueler equipped with a Velcon filter vessel which had been changed prior to being shipped to us on a short term lease agreement for the Acadian Heritage Air Show held August 9 and 10. We received the unit on August 5. The unit was empty on arrival. I personally verified that it was purged before top loading 100.1 gallons into the tank on August 5. At 0917 August 6 I personally pumped 5.2 gal into a container for non-aeronautical use and completed a fuel test consisting of a white bucket test and an API Gravity test. The results were recorded and are on file. The fuel was tested in a standard fuel test beaker and the unadjusted reading was 66.4 @ 64 degrees F or adjusted to 60 F at 65.8. This fell well within the normal range as indicated on the Gammon Technical Products 3012-3A calibration wheel for API Gravity for AVGAS. We top loaded directly from our tank farm 384.1 gallons on August 7, 382 gallons on August 8, 193 gallons on August 9, 450 gallons on August 9, and 203.1 gal on August 10. In summary all fuel dispensed from the unit was filtered twice and all the fuel dispensed into Bill Werth's aircraft came from this unit. I did not personally dispense the fuel into N34BJ. My Line Service Log shows that we dispensed 31.2 gallons of AVGAS immediately prior to his departure on August 10. The ticket is time stamped 02:28:47 at the starting point of fueling. Bill Werth verbally stated to me by phone on August 11 that he topped off all his tanks on departure.

We dispensed 1320.9 gallons of AVGAS without any issues prior to dispensing Bill Werth's 31.2 gallons.

I hope this will be helpful

Sincerely,

David Fernald Sr
Airport Manager
Northern Aroostook Regional Airport
[REDACTED]

From: Stein Stephen [REDACTED]
To: David Fernald [REDACTED]
Cc: David Fernald [REDACTED]
Sent: Friday, October 3, 2014 8:49 AM
Subject: RE: NTSB Investigation - N34BJ

Hi David,

Thanks for your help.

Stephen

From: David Fernald [REDACTED]
Sent: Friday, October 03, 2014 8:43 AM
To: Stein Stephen

Cc: David Fernald
Subject: Re: NTSB Investigation - N34BJ

Hi Stephen,

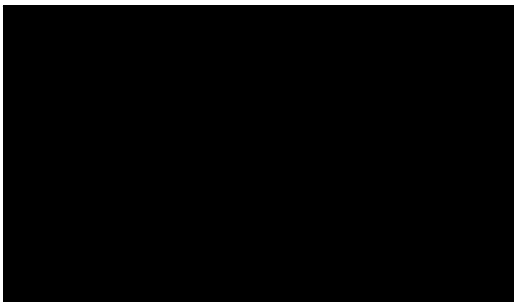
I have copied my father on this email, and will discuss the details you are looking for with him by phone.

Thanks for the call and let us know if there is anything else we can help you with.

Make it a great day!

David A Fernald Jr.
Aviation Unlimited

FAA and Nautical Charts for less!



On Oct 3, 2014, at 7:34 AM, "Stein Stephen"  wrote:

Thanks in advance.

We are looking for fuel contamination records for 8/10/2014

All refueling records for N34BJ for that day.

Stephen Stein
Air Safety Investigator
National Transportation Safety Board
Eastern Region Aviation



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MEMORANDUM FOR RECORD

Stephen Stein
Air Safety Investigator
National Transportation Safety Board
Office of Aviation Safety - Eastern Region

NTSB Accident Number: ERA14LA378
Aircraft Registration & Make/Model: N34BJ; Christen Eagle 540
Accident Location: Standish, Maine
Accident Date: August 10, 2014

Note: The following interviews were conducted by the Investigator –In-Charge (IIC).

Interview Summary

Wayne Whitten
Airframe and Powerplant Mechanic

Interview date/time: April 22, 2015; 0846 EDT
Telephone

Interviewer was Stein.

Mr. Whitten reported that he performed follow-up examinations of the fuel distributor and fuel pump. Inspection of the fuel distributor revealed no blockages or anomalies. The fuel pump was tested and no anomalies were noted.