Silliman James

From: Bob Heiser [redacted]
Sent: Saturday, April 21, 2012 4:05 PM
To: Silliman James
Subject: Re: N912RV Fuel Pump

Pump In box, ready to ship on Monday.
Have one other report of Facet pump failure in a Pulsar.

Here is some research done by another Pulsar pilot.

I did a little research on the Webb concerning Facet fuel pump failures. There is a marine site claiming that this failure mode is/was fairly common and that Facet knew about it but did not go through a recall. Instead Facet came out with a new model, the E model that does not have this failure mode and assumed the others would eventually be sold and replaced with the new model. It seems that Spruce sells both, not sure if the Spruce non-E model has the problem solved or not.

This failure mode was completely unknown to me.

Dennis Adams
N375CM

Working on NTSB report. Have pencil copy ready to copy.
God Bless
Bob Heiser W7IKT

On 4/21/2012 10:29 AM, Silliman James wrote:
Please ship the fuel pump to me at:

[redacted]

From: Bob Heiser
To: Silliman James
Sent: Sat Apr 21 08:50:34 2012
Subject: N912RV trouble shooting results

N912RV loss of power on takeoff - trouble shooting.

- Checked inside the right tank for debris none found.

- The tank appeared empty, no gas came out of quick drain. We removed the quick drain with a pan to catch any gas or debris. We drained about and ounce of gas, trapped

because the quick drain extends into the wing. No water and just a few specks of dirt were found.

- Removed mechanical fuel pump and it worked properly.

- The clear fuel filter (in fuel line going to mechanical pump) was empty.

- We tried blowing air into the tank from the fuel hose that connects to the input of the mechanical pump. Unable to blow air into either tank.

- The route of fuel to the mechanical fuel pump is: Tank, fuel selector 12v Electric fuel pump, clear glass fuel filter, mechanical pump.

- We removed the hose between the fuel selector and 12v electric fuel pump. Still unable to blow through the electric pump. Note, all that is left is 1 hose and the 12v electric pump. All the fuel hoses were in good condition, no swelling, able to look thru the short hoses.

- We removed the wings because the spars prevented access to the 12v electric fuel pump. Access to the electric pump was still difficult thru a hole in the seat bottom. After we removed the electric pump it was no longer restricted. The removal process cleared the obstruction. We checked the fuel line from the mechanical fuel pump to the electric pump for debris, none found.

Note the Facet 574A fuel pump was supplied in the Aero Designs Kit. It is turned on for 15 seconds prior to engine start. There have been reports of the electric pump and mechanical pump both on flooding the carb's. Therefor the pump is left off for normal operation. During flight testing N912RV I did notice higher than recommended fuel pressures with both fuel pumps operating.

When telling the trouble shooting story on the airport a pilot friend said he had a similar problem with a 12v automotive electric fuel pump in a SkyBolt he built years ago. The problem was a vane stopping in the wrong position and stopping fuel flow.

I do not remember any reports of 12v fuel pump problems from either the Pulsar or Rotax on line groups. I will send out a question to both groups.

If you would like to examine the 12v fuel pump I will pack and ship.

Sincerely,
Robert C. Heiser Jr.

Silliman James

From: Bob Heiser [redacted]
Sent: Sunday, April 22, 2012 5:09 PM
To: Silliman James; Mark FAA Mcdougall
Subject: NTSB 6120.1
Attachments: To fill inNTSB 6120_.pdf

Jim & Mark,
Attached is NTSB Form 6120.1

One of my neighbor pilots visited today and asked if I had checked the fuel vent.
When we checked it was blocked. Not visible from the outside. We could feel the blockage with a wire.
I have removed the end of the blocked fuel vent and will ship it with the fuel pump.

The 912uls burns 4.5 to 5 gallons/hour or about 1 oz per minute. Less during taxi.
Do not think 4 oz out of a 9.5 gallon tank could create enough of a vacuum to stop fuel flow.
Please tell me if you think this wrong.
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God Bless
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Silliman James

From: Bob Heiser [redacted]
Sent: Monday, April 23, 2012 11:59 AM
To: Silliman James
Cc: [redacted] Mark FAA Mcdougall
Subject: Re: CEN12LA249: NTSB 6120.1

Jim,
Just looked at the copy I send and the text was there. Some computer glitch. Here is the narrative text, and the recommendations that I suspect were also missing.

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Narrative

Purpose of flight was to get current to carry passengers. Neither N912RV nor I had flown for the last 4 months. A detailed preflight (top cowling removed) was performed before the flight and fuel was added to the right tank, Bringing total fuel in the tank to 6 gallons. The planned 20 to 30 minute flight would use less than half the 6 gallons in the right tank, 3 gallons were in the left tank. I check the weather daily on internet. Just before the flight, a look at the sky and my wind speed and direction indicator showed scattered clouds at 5000' with 5k wind from the East. I pulled the plane from the hanger. Engine start, taxi and run up were all normal. After checking the ignition systems I let the engine run at 4000 rpm to raise the oil temp to 120F. It took 4 minutes from engine start for the engine to reach 120F. I completed the takeoff check list, made radio call and started Takeoff. Takeoff and climb to 50-60 feet was normal. At about 50' the engine lost power, there was enough power to fly and the trees at runway end looked close, I chose to start a right turn to make a short pattern and land. After I had turned about 30 degrees, the engine died completely. I leveled the wings and landed hard in a wheat field on the West side of the airport. I exited the plane and waited for help. The terrain at and around the airport is flat. The airplane stayed in one piece except the canopy landed about 20' in front of the airplane and the right wheel has never been found in the wheat field after 3 searches. Ducote Air Park (TS65) was the point of departure and the intended destination.

Recommendations:

1. Do not use automotive parts in an aircraft fuel system.
2. Review before each flight what you will do if the engine fails at low altitude. This is stressed more for multiengine aircraft.

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God Bless
Bob Heiser W7IKT

On 4/23/2012 10:43 AM, Silliman James wrote:
Bob,

Thanks for all the information about the fuel system checks. I can't respond to your questions right now since I'm dealing with new accidents this morning.

I received the NTSB report and noticed that you had not included a Narrative History of Flight (page 10). Please send me an email with a description of the flight. Thanks.

I will be looking for the fuel pump and fuel vent. Thanks for sending them to me.

Jim

From: Bob Heiser [mailto:[redacted]
Sent: Sunday, April 22, 2012 5:09 PM
To: Silliman James; Mark FAA Mcdougall
Subject: NTSB 6120.1

Jim & Mark,
Attached is NTSB Form 6120.1

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--

God Bless
Bob Heiser W7IKT

Silliman James

From: Bob Heiser [redacted]
Sent: Monday, April 23, 2012 12:20 PM
To: Silliman James
Cc: Mark FAA Mcdougall; [redacted]
Subject: N912RV plugged vent

Jim,
Do not think the plugged vent was the problem. When I have gotten the tanks full I get gas stains on the wing trailing from the gas cap.
Here is a comment from another Pulsar Pilot on her experience with a plugged fuel vent.
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The engine driven pump can overcome quite a substantial amount of vacuum, as I have found out by accident. When I bought my Pulsar, one of the vents was permanently clogged by fuel tank sealant. I did not know that and flew it home like that. Fortunately the fuel cap leaked a bit, but every time I opened it after a flight, there was low pressure in the tank, the cap stuck to it and air was audibly rushing into the tank. The engine operated normally in that condition, even with the electric pump off.

Sonja Englert
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God Bless
Bob Heiser W7IKT

Silliman James

From: Bob Heiser [redacted]
Sent: Monday, April 30, 2012 11:33 AM
To: Silliman James
Cc: Mark FAA Mcdougall
Subject: N912RV - Facet Fuel Pump
Attachments: Scan0015.pdf

Attached is a copy of a post to the Pulsar Builder email reflector from March 1999 about Facet fuel pumps. You can see my hand written notes on the page when I checked the fuel pump supplied with the Aero Designs Pulsar kit in 1995.
The material inside the outlet valve on my pump was white and I used the pump.

Also I uderstand the what I thought was the fuel pump model number, 574A is a UL number and the model number is on the back of the pump.
--
God Bless
Bob Heiser W7IKT

Checked 9-14-99 PCH

FACET FUEL PUMP ALERT

Date: 3/5/99 12:09:36 AM Central Standard Time
From [redacted] (Wallace Judd)
Sender: [redacted]
Reply-to: [redacted]
To: [redacted] (Pulsar Users Group)

Funny this should come up -- I just returned from an EAA chapter meeting in San Jose where there was a Fuel Pump Alert--specifically on the Facet Solid State Electronic Pump.

The upshot is that THERE ARE SERIOUS PROBLEMS with the Viton valves in the outlet of the pump. The pumps in question have serial number sequence 40023, 480615, or 480616 -- but some pumps have identified as problematic that don't have this number.

You can check your pump this way:

1) On the outlet side of the pump, (but inside the valve) there's a single pin across the outlet opening. The newer pumps have a double pin across the outlet. single pin

2) If you look inside the outlet valve, the check valve material is black. The newer pins have Nylon valves which are white. white is newer

3) The old-style pumps have a switching transistor cannister on the exterior. The new-style pumps have the transistor mounted internally. no canister

If you have any doubt at all, throw your old pump away and get a new one. For $30, it isn't worth a crash. The guy who showed us the pump had pulled his off his plane after a dead-stick landing. The Old check valve material is made of Viton, the material softens, it distorts and plugs the outlet, effectively shutting off fuel flow to the engine.

Many Facet pumps are OEM'ed, so they may have a different name on them, or no name at all. They're the small, rectangular electronic fuel pumps that come with our kits.

Blue skies to all --