EAA Mount Rainier Chapter 326 Newsletter

Thun Field - June 2004 66

Meeting Notice

Tuesday, June 8th, 7 PM
CAP Building, Thun Field

Program: F1 Rocket Show & Tell. Dave Latham

Refreshments: Ward Morris

Adjournment: TBA

From the Secretary

May 11th, 2004

The meeting was called to order by Kevin Behrent.

Today's guest was Steve & Robert from Seattle Avionics (a maker of PC flight planning software)

Dick Migas, Al Rieter, & Curt Bryan brought the refreshments. Thanks guys!

Young Eagles will be June 12th this year, plan for 350 kids! John Brick and Dennis Ward will be doing the phone pre-work for next month to sign up the kids.

Patches, hats & Polo's are still being sold. Jackets are being made this month.

Visitors:

- Seth Anderson – Newly interested in Aviation
- Jim Hall – Varieze & Phantom ultralight (long time EAA member)
- Chick Masoner – hails from Walla Walla, building a Q200

Steve & Robert presented all about Vision, a new product from Seattle Avionics. It is a complete preflight planning software. Vision includes weather, route planning, flight plans, etc., and looks very full featured. Go to http://www.seattleavionics.com/ for all the details. Cost is about $200 for the software and $100 per year for updates and data downloads.

See everyone at Young Eagles Day!

Andy

Young Eagles Day
Saturday June 12th

Set up: Friday June 11th at 7PM. Bob Pailca's Hangar

Pilot Briefing: Saturday **0900 sharp.**

Blocks of 25 kids will start flying at 10 AM and continue at half hour intervals until the last block at 4:30. That's 350 kids

Terry Breiting Young Eagles Coordinator 253-312-9188
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Arlington Camping
July 7 - 11

We will be camped in the same area as in previous years, rows B and C behind the airshow aircraft parking area. Pot luck will be after the airshow on Saturday. This is for all our members whether camping with us or not.

Blocked Oil Breather Can Cause Carb to Flood

A blocked oil breather can flood the carburetor and stop the engine. Here's what happens:

This malady pertains to Lycomings that have a diaphragm style fuel pump. Not all Lycomings use the diaphragm style fuel pump, but most 4-cylinder engines and carbureted 540's do, and a few IO-540's as well. The O-235 series uses the diaphragm style pump. The other style fuel pump Lycoming uses is a rotary pump. The rotary pump is mounted with four nuts in a rectangular pattern. The diaphragm pump is a lever action style pump that is mounted with two bolts.

The first thing you need to know is that the diaphragm style fuel pump's relief valve is vented into the crankcase and will affect the pump's output pressure. This vent is through the lever arm portion of the pump to the inside of the engine. We're not talking about the overboard drain from the pump. That is on the outside of the pump and vents oil and / or fuel overboard in case of an internal leak inside the pump.

What happens, is when the oil breather is restricted or completely plugged up, the air pressure inside of the crankcase increases due to the fact that the natural blow by past the piston rings is no longer vented to atmosphere. The more you run the engine, the more the pressure builds with a plugged breather. The fuel pressure keeps increasing as the crankcase pressure increases

due to the fact that the pump is sensing a higher reference pressure through its vent into the crankcase. Eventually the crankcase pressure rises to a point, that the fuel pressure becomes excessive and this high fuel pressure literally forces the needle valve in the carburetor open when it really wants to be closed. Once this happens, the float level in the carburetor rises and the engine gets richer. Eventually the float level becomes so high that the float chamber overfills completely and fuel overflows out the bowl vent, in the carburetor throat, into the engine's inlet airflow. This produces an extremely rich mixture that won't burn properly and the engine stops running. Basically, it's flooded.

If you pull back on the mixture control you might be able to find a sweet spot and keep it running! Once back on the ground, with the engine shut down the crankcase pressure eventually equalizes back through the rings through an open intake valve to be at atmospheric again. So when you try to restart, it fires right up like nothing was wrong. You have to continue to run the engine to build up the crankcase pressure until the whole thing happens again, to re-experience the problem. If you don't run the engine long enough you think the problem went away. It is a really dangerous condition because it takes a while for the crankcase pressure to build up enough to make the engine quit. Unfortunately, that seems to be a few minutes into the flight.

It is very important to have a vent in the breather line in case the end of the breather freezes up in the winter. What I would do is put a two-inch long razor blade slit in the hose that connects the breather pipe to the engine, or in the breather hose if no pipe is used, right near the engine with the slit up. This is a secondary safety device; when things are normal, the razor blade slit stays closed as there is no pressure in the overboard line. If the breather becomes frozen or plugged for some other reason, the air pressure in the overboard hose will increase and force the slit to open up and the pressure will be relieved.

As we have discussed plugging up the breather causes the crankcase pressure to increase; this can also cause oil seals to blow out, normally the crankshaft nose seal. If this happens the crankcase pressure gets vented and the engine doesn't quit but you get a big oil leak.

Mahlon Russell

Wandering RPM

My Lycoming O-320 runs strong and trouble free, no problems. But since I installed a digital tachometer I can see that the engine RPM wanders up and down 20 to 30 RPM with no throttle, mixture, or altitude/attitude change. The drift in RPM occurs over a four or five minute period typically.
John

Not sure if we are talking about a fixed pitch prop here but you didn't mention otherwise. With my fixed pitch prop, conventional mags and digital tach, I find my RPM varies a bit too. I have always figured this is an example of a digital gauge providing a little too much information.

Thirty RPM of variation is only around +/- one percent. That slight of a variation might be hard to see on an analog tachometer, but easy to notice on a digital one. Five minutes is a fairly long time constant – around sixteen miles at cruise speeds. I would think that over five minutes, or sixteen miles, there is going to be some kind of variation in the air mass we are flying through - air temperature, pressure, vertical velocity, etc. That variability will either affect the engine directly or else cause our altitude to vary slightly. As we notice the altitude change we would instinctively adjust the attitude of the aircraft to keep our altitude constant, and with the slight change in angle of attack, our speed, and RPM in the case of a fixed pitch prop, would vary slightly. Or the autopilot will make the same correction for us and all we would notice would be the RPM slowly changing. This kind of attitude/RPM relationship is pretty obvious if you are flying through summer thermals, but it must exist in every air mass to a certain extent.

I have done about twenty 4-way GPS speed runs in my airplane (RV-6 O-320), and I find that nailing an altitude and digital RPM around a five mile box with a fixed pitch prop is really hard. The best I can manage while leaving the throttle and mixture locked is about +/-20 RPM. In cruise I seldom try to set the RPM exactly. I just find a suitable setting based on fuel flow and let the RPM wander where it will.

If we are talking about a constant speed prop, the above could still happen depending on how accurately the governor tracks a set RPM. There could be a bit of hysteresis or error in the system. Since I have no experience with CS props I'll stop there.

Curt Reimer

Over Square

With constant speed propellers, most of us were taught to manage RPM so that it did not fall below manifold pressure. Square being **25**00 rpm and **25** inches mp, for example. Over square is violation of that rule; it means operating with manifold pressure higher than RPM, e.g. MP **25** inches with **23**00 RPM. To avoid this, the technique is to always increase RPM first when increasing power and to decrease manifold pressure first when decreasing power.

Kevin Horton wrote:

RPM does matter. Once the spark plug fires it takes the flame front a certain amount of time to travel across the whole cylinder. This isn't an explosion, but controlled combustion. The spark fires before top dead center, i.e. when the piston is still moving towards the cylinder head. But the piston is moving fast enough so that it has passed top dead center and is moving on the power stroke when the combustion has raised the cylinder pressures too high.

Our magnetos have fixed timing that is designed to work properly in a certain rpm range. If the rpm is very low and we have full throttle, the piston is moving much slower. But the flame front still moves at its normal speed. So the cylinder pressures will reach their peak while the piston is still moving towards the head. This puts a huge load on the cylinder, piston, connecting rod, crank, bearings, etc. Also keep in mind that the

oil pressure will be low, as the oil pump isn't turning very fast, and imagine what happens at the bearings.

The ignition timing in our cars varies so the spark would occur much closer to top dead center in the high manifold pressure and low rpm case. Each engine has a certain limit of manifold pressure vs rpm that is acceptable, given a particular fuel and ignition timing. Some engines can tolerate highly "over square" operation and some can't. As a general rule, you can't generalize from the over square "rule." Look at the Lycoming operator's manual for your engine. The power charts probably have a line that shows the limiting manifold pressure for any given rpm.

Other Aircraft on Display
F-14 Torncat, A-7 Corsair II, A-4 Skyhawk
Fairchild GK-I, KamanHUK-l Helicopter
Nord 1101, Bell Helicopter, Cessna 180
Chris-Tena Mini-Coupe, Quickie Homebuilt
Aircraft Engine Display
Military Vehicle Display

It's a nice flight to Tillamook airport, S-47, and you can taxi to the Museum. They are open everyday except Thanksgiving and Christmas. Summer hours: 9AM – 6PM

Tillamook Air Museum
The History

In 1942, the U.S. Navy began construction of 17 wooden hangars to house the K-class blimps being used for anti-submarine coast patrol and convoy escort. Two of these hangars were built at Naval Air Station Tillarnook, commissioned in December 1942 to serve the Oregon-Washington coastal area.

Construction of the two hangars was rushed to completion. Hangar "B" was the first one built and was completed in the spring of 1943. Hangar "A" which was destroyed in a 1992 fire, was completed in only 30 days. Amazingly, there were no serious injuries or deaths on the whole project.

Stationed at NAS Tillamook was Squadron ZP-33 with a complement of 8 K-ships. The K-ships were 252 feet long and filled with 425,000 cu. ft. of helium. With a range of 2,000 miles and an ability to stay aloft for 3 days, they were well suited for coast patrol and convoy escort. Naval Air Station Tillamook was decommissioned in 1948.

Since 1994, the remaining hangar has been home to one of the finest collections of privately owned WWII flying aircraft in the nation.

Facts about Hangar B
Length 1,072 feet
Height 192 feet (over 15 stories)
Width 296 feet
Area Over 7 acres (enough to play six football games!)
Doors 120 feet high, 6 sections each weighing 30 tons (180tons total.) 220 feet wide openings. The sections roll on railroad tracks.
Catwalks Two catwalks, each 137 feet above the hangar deck.

The Aircraft Collection

1934 BellancaAir Cruiser, TBM Avenger, PBY-5A
Catalina, F4U Corsair, SBD Dauntless, L-29 Delphin
J2F-6 Duck, PV-2 Harpoon, A-26 Douglas Invader
P-38 Lightning, AM-1 Martin Mauler, Me-109 Messerschmitt
Mini-Guppy (Boeing 377 Stratocruiser), B-25 Mitchell
P-51 Mustang, P2V Neptune, C-47 Sky train
AD-4W Skyraider, 1917SpadXm, MkVIll Spitfire
PT-17 Stearman, T-6 Texan, P-47 Thunderbolt , FM-2 Wildcat

Calendar

June 5, Spokane, Felts Field (SFF), EAA Chapter 79 Fly-In
June 5, Lynden Fly-In, Barbecue and Dutch Parade
June 12, **Young Eagles Day – Thun field**
June 19, RV Fly-In, Scappoose (SPB)
June 18, 19, 20, Olympia, 6th Annual Gathering of Warbirds
June 26, 27, Bellingham Airfest
July 4, Tacoma, Tacoma Freedom Fair Air Show
July 7–11, Arlington, 35th Annual Northwest EAA Fly-In.
July 17, 18, Port Townsend, EAA Chapter 1026 Annual Fly-In. Camping available
July 23, 24, 25, Pasco, Tri-City Columbia Cup Airshow
July 24, 25, Spokane, 2004 Inland Northwest SkyFest
July 27–August 2, EAA AirVenture, Oshkosh (OSH)
July 31, Forks, 14th Annual Fly-In, Salmon Bake, Car Show & Burnout Contest
August 6, 7, 8 Eastsound , Orcas Island Fly-In. EAA #937.
August 7, Diamond Point Airport Association presents Airport Day, 10 a.m.-3 p.m.
August 20, 21, 22, Formerly Evergreen Fly-In, now at McMinnville
August 24, Hoquiam. EAA Chapter 367 Fly-In and old fashioned homemade ice cream social - free to pilots/passengers at Bowerman Field (HQM).
August 28, Port Angeles, Ultimate Airport Day
September 4, 5, Van's Homecoming. Aurora State (UAO)
September 11, Dallesport, The Dalles Fly In / Airshow

All men dream, but not equally. Those who dream by night in the dusty recesses of their minds, wake in the day that it was vanity: but the dreamers of the day are dangerous men, for they may act on their dreams with open eyes, to make them possible.

T.E. Lawrence

End

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