



EAA Chapter 100

December 2015 Newsletter

<http://eaa100.org>

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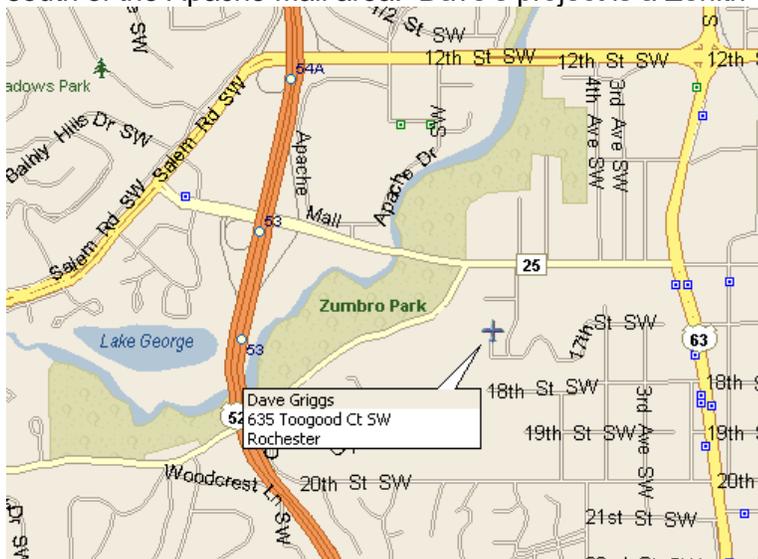
Young Eagles
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EAA Chapter 100 is a nonprofit association involved in the promotion of aviation through adult and youth education, hands-on training, building and maintenance of experimental aircraft, and through community awareness programs.

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Reader submissions and comments are strongly encouraged.

The next Chapter 100 Hangar Flying Event will be December 11th at Dave Griggs' home. The fun starts about 1900L. Dave and his wife live at 635 Toogood Ct. SW, Rochester. This is just south of the Apache Mall area. Dave's project is a Zenith 750.



Minutes from the November EAA Chapter 100 Hangar Flying Event.

The November 13th meeting of EAA 100 was hosted by John Puent at his home. He showed and shared his two current projects: A Jodel D11 and a Zenith 601 HD.

Both are interesting; the Jodel being of wooden construction and the Zenith; metal. We are approaching "Dues Time". The \$ 10.00 annual dues can be given to: Tom Hall or any Chapter officer any time now. The membership is from Jan. 1st till the end of the year.

Tom Hall bought Hangar # 9; directly East of the Chapter hangar. His Gyroplane will relocate there and there may be space for another Member aircraft in the Chapter hangar.

Respectfully submitted, Tom Hall, Secretary – Treasurer



December Business Meeting Cancelled. My apologies for completely forgetting to send notices of the scheduled December 1st business meeting. Because of my error, we had to cancel the meeting due to short notice and not getting an agenda to our membership before the meeting date. A 2016 business meeting schedule will be forthcoming.

Dues Due: As Tom Hall mentioned in the last meeting minutes the 2016 \$10 chapter dues can be paid anytime. Only members who have paid their dues are allowed to vote at business meetings.

Steps to EAA Chapter 100 Membership:

- Have a fascination or love of flying. You don't have to be a pilot or be building an airplane, you just have to be interested in the same.
 - Join the National EAA (<http://www.eaa.org/ea>)
 - Pay the \$10 chapter dues to our Secretary/Treasurer or any officer
 - Treasurer is Tom Hall, 331 Riverview Heights Drive N.E. Rochester, MN 55906.
 - It would be "nice" if you would fill out our [questionnaire](#) and send it with your check.
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WINGS FAASafety Team Safety Seminar:

Fellow Chapter 100 member and FAA Safety Repetitive, Derwin Hammond, is sponsoring an FAA WINGS seminar, 1830 Tuesday **December 15th** at the Carpenters Training Center 6692 10th Ave SW, Rochester. This is near KRST airport and directions are on the sign up website by clicking the "View Map" link.

Subject is "Accident Casual Factors"

Topic: Accident/Incident data from NTSB/FAA reports detailing the results of poor preflight planning including: Safety considerations that were over looked or ignored on preflight planning. VFR cross country flights discussed including type of navigation, GPS, land based NAVAIDS, pilotage, and dead reckoning. Weather vs. Terrain, hazards to consider obstacle clearance, bird activity, wire strike. Flight below VFR minimums, VFR into IMC scud running, CFIT, emergency procedures/including off airport landings water vs. land, survival gear.

The following credit(s) are available for the WINGS Programs: Basic Knowledge 3 - 1 Credit and Advanced Knowledge 1 - 1 Credit

Registration is not required, but it would be appreciated for our planning purposes. Sign into your FAASafety account at: <https://www.faasafety.gov/default.aspx> then click "Find Seminars" in the "Upcoming Seminars" box then click Minnesota on the map.

Builders Log

My Brother-In-Law has a friend building an S-20 Raven. It's been almost a year since the kit was ordered and I find the builder's log quite interesting and informative. Take a look at: www.mykitlog.com/bthorne222

Abnormals

By Aviation Safety Magazine Staff

Things can go "bump" in the night. Daytime, too. Most of them either have been considered before or encountered by someone, resulting in a section of your AFM/POH labeled "Emergency Procedures."

But not everything that can happen is covered there: Pilots are constantly inventing new ways to screw up, and the aircraft themselves can present something new and different, or at least

something that appears new and different, especially as they age. The bad news is there's no checklist to cover everything that can go wrong. The good news? Some portion or combination of checklists might get you through. The better news? A solid understanding of how the aircraft's systems work and their various failure modes provides you an excellent chance to get home.

Partial Engine Failure

Let's start with engine failures of the partial kind, insofar as they involve a gasoline-fueled piston single (twin drivers have a bunch of other options). Your AFM/POH no doubt has a section covering complete engine failure, remedial actions and the procedures to follow to execute an emergency, off-field landing. But what if the engine is running, just not very well?

A partial engine failure can have many different causes. There are cylinder failures, induction-system blockages, fuel-flow problems and ignition-system faults. You have tools in the cockpit with which to tackle these issues by addressing the three things all engines need: fuel, air and spark. (Diesel aircraft engines don't need the spark, but they may need some electrical power to run their electronic control system.) The only other kind of issue an engine is likely to suffer is mechanical, which rarely can be fixed from the cockpit. But if it involves fuel, air or spark, we might be able to fix it.

Electrical issues with the airplanes most of us fly begin and end with the magnetos, harness and spark plugs. A rough-running engine could be the result of fouled plugs, but this usually shows up in the pre-takeoff mag checks. Regardless, an in-flight mag check is appropriate if you suspect an ignition problem.

To perform one in cruise, leave the other engine controls alone, then do what you do during the pre-takeoff run-up, with one exception: If the engine dies on one mag, or you inadvertently find the "off" position, do not immediately switch back to both or to the good mag. However tempting/reflexive it may be, doing so risks a potentially damaging backfire from the accumulated air/fuel mixture in the intake system. Instead, reduce throttle to idle before switching the mags back to the good position, then bring up the power.

During that mag check, and throughout any attempts to diagnose an engine problem, pay close attention to what your engine monitor is telling you (You do have one, right?). For instance, a well-running piston engine should exhibit an EGT rise on all cylinders after switching from both mags to only one. If one or more cylinders' EGT drops out, there's your problem. Proceed on the good mag. If nothing happens to the EGTs when performing this check, the switch may be defective.

Inadequate airflow to a rough-running engine also may be diagnosed from the cockpit. It can be caused by a blocked/collapsed intake or filter, airframe icing at the intake or good old-fashioned carb ice. Apply carburetor heat or alternate air, depending on the installation. If that doesn't work, but you're convinced the problem is insufficient airflow due to a blockage, our previous admonition



about backfires no longer applies: Creating one as previously described may clear the blockage, but you're risking damage.

Fuel-related issues probably are the most common source of partial engine failures, after mechanicals. Here, also, you have some tools. If you have it, monitor the fuel-flow/pressure instrumentation throughout your diagnostic efforts.

The first and most obvious action is to switch tanks, even if you're running on "both." Since the problem may involve one tank's plumbing or venting system, see if the engine will run better on another tank, even if it's not the fullest.

Engage the electric fuel pump, if you have one. Some electric pumps are single-speed (on/off); some are two-speed. Try the low setting first, then the high one if things don't get better. Be

aware that using an electric fuel pump can flood the engine with too much fuel, temporarily making the problem worse until you lean the mixture to compensate. If the problem resolves itself at the new mixture setting, you've likely experienced an engine-driven fuel pump failure.

Finally, don't forget the engine controls: Pushing and/or pulling on the throttle, mixture and prop control may help you find a sweet spot that keeps the engine running, or fixes the problem, long enough to get to a runway. Which control to try first is a toss-up, though, perhaps depending on what the symptoms are. For example, a sudden vibration not reflected on the engine monitor could mean the prop is the problem. On the other hand, a gradual loss of power could result from either of the three control linkages having failed.

For a generic, not-enough-power kind of problem, we'd probably try the mixture first, enriching it from leaned to ensure there's enough fuel flowing. If it's already full rich, lean it some to see what happens. The throttle would be next, running it up or down a bit to see what, if anything, changes. If none of that helps, use the prop control to find the best rpm setting, one that smooths out any roughness.

Other kinds of partial engine failures usually involve a mechanical issue, probably involving cylinders—a swallowed or stuck valve, for example. The one time we saw a swallowed valve up close and personal, it was an intake valve, the pieces of which bounced around in only one side of the induction system, creating all kinds of havoc. This was depicted on the engine monitor by wildly fluctuating EGTs for the affected three cylinders but normal indications for the other three. There was enough power remaining to get the airplane onto the nearest runway without additional damage.

Control System

Many pilots may find at least one control system-related failure checklist in their AFM/POH, perhaps involving a jammed pitch control. Few AFM/POHs, if any, get into what to do about a failure where the cables or pushrods have failed but the surface remains attached to the airframe. Presuming there's no outright break in continuity from the cockpit to the control surface, something's binding. If it comes on suddenly, as opposed to progressively stiffer ailerons, for example, there are a couple of likely causes.



One potential cause is frozen water impinging on the linkage (cable/pushrod) or the surface itself. Obviously, any water present in the system can't freeze if it's too warm outside, so descend to warmer air and wait a few minutes, then try the control again. Use reduced power to descend if the stuck surface is your pitch control. Another potential cause can be a cable that's jumped off its pulley. That usually doesn't happen unless the pulley mount itself fails or the cables have much more slack in them than specified.

A third cause can be a nearby wiring bundle or other obstruction interfering with full and free control movement. This usually happens behind the instrument panel and, if that area can be accessed in flight and it's safe to do so, you might give it a shot. Another cause can involve something—or someone—interfering with the controls. Is your right

-seat passenger resting his/her feet on them? Is there an obstruction underneath one of the pedals? Is a passenger interfering with the yoke's full movement?

A final control-system malfunction involves a split-flap condition: One of them is up; the other is down, creating a rolling moment you may or may not be able to counter with aileron alone, especially at slow speeds. Hopefully, the fix for this is simple: retract the flaps, raising the one that extended and leave them alone until engine shutdown. If one won't retract and the other one will, extend the working flap to balance the rolling moment. Split-flap conditions are rare, but do happen. Preventing them from happening at the worst possible time is a good reason not to extend the flaps while in a bank.

Putting it all together

Intimate knowledge of your aircraft and its systems can get you through a problem not covered in the AFM/POH. Careful study of the control and landing-gear systems can highlight weak points worthy of extra attention during inspections and regular maintenance, and help with diagnosing the problem from the cockpit. Meanwhile, flying an airplane into the freezing flight levels after it sat outside in the rain might not be a good idea, nor is allowing loose items to roll around in the cockpit, or under the instrument panel.



In any event, encountering a problem such as we've described likely is a clear sign your flying is done for the day. Even if you can resolve the issue while airborne, it's probably a good idea to land at the nearest suitable facility to regroup. A "suitable" facility can be the nearest runway if you're concerned the problem isn't resolved and could worsen, or if you're too shook up to continue. Presuming none of that applies, the nearest airport with full maintenance facilities, an open FBO and rental cars, plus a nearby adult drinking establishment, would be our first choice.

This article originally appeared in the November 2013 issue of [Aviation Safety](#) magazine. For more great content like this, [subscribe to Aviation Safety](#)!

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