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Inside this issue:

- Improper Hose Fabrication 2
- Inspecting Unfamiliar Aircraft 3
- Amateur-Built Aircraft Flight Manual Online 3
- Horizontal Tail Coefficient 4

Message From Headquarters

Joe Norris, EAA Homebuilders Community Manager

Those of you who attended this year’s EAA convention know that it was not “business as usual”. The weather presented us with a huge challenge, with record rainfall in July. This left us facing the wettest convention site in anyone’s memory. For the first time in history the airport was actually closed to arriving traffic for more than a day!

Fortunately the rains held off once the convention started, but the damage was already done and some areas of the convention grounds and Camp Scholler remained unusable for the duration.

Even with all the challenges the convention could not be thought of as anything but a success. While overall attendance was down from 2009, the workshop area remained one of the strongest draws on the grounds. More than 6,000 attendees took advantage of the workshops presented during convention, and a big “thank you” goes out to all of you who helped out throughout the week. Your continued efforts on behalf of the EAA craftsman members as well as potential homebuilders and restorers in attendance are very much appreciated.

Of course, once the airplanes and campers all depart the grounds those of us here at EAA headquarters begin the task of creating our “after action reports” and start putting together notes

for next year’s convention and beyond. The results of this year’s convention presents us with a number of challenges that affect not only coming conventions but EAA’s operations overall. These challenges have been keeping us very busy, and will continue to do so for the foreseeable future.

One of the challenges we as Technical Counselors and Flight Advisors face is promoting participation in EAA’s Safety Programs. It is incumbent upon each and every one of us to be our own public relations department anytime we talk with homebuilders or aircraft restorers. It is also a good thing to look within and make sure we’re doing the best job we can. In that vein I ask all of you to let us know whenever you have an idea that might help to spur participation in the programs. Also pass along any ideas you might have for improving the programs internally. We always welcome input, so don’t be shy!

As usual I’ll close by inviting all of you to share what you see in the field. Please take time to share your experiences and knowledge with your fellow EAA Flight Advisors and Technical Counselors. Send your articles via “snail mail” to EAA Safety Programs, PO Box 3086, Oshkosh, WI 54903-3086. You may also submit articles via email to safetyprograms@eaa.org

Improper Hose Fabrication

This is a story about an emergency landing that was caused by the failure of an improperly assembled oil cooler hose. It provides food for thought as you perform your Technical Counselor inspections.

The aircraft departed the airport for a planned 90 minute cross-country flight. The aircraft had sixty four hours total flight time, but was flying with a new prop and a zero-time rebuilt engine. The preflight inspection, run up and take off were normal, and seven minutes after takeoff the aircraft was leveling off at 9500 msl. As power was reduced for cruise the RPM suddenly went to 3200. The pilot reduced power and declared an emergency, then turned toward the nearest airport, which was 11.5 miles away.

The aircraft was descending with power reduced to keep RPM below 2500 when the engine began to vibrate severely. Altitude was below 5000 msl and the distance to the airport was 7 miles. The engine was no longer producing power and there was a low oil pressure indication. The pilot pulled the mixture back to full lean and raised the nose to stop the prop. ATC advised of a divided highway three miles ahead, which appeared to be the best option for a forced landing as the area was heavily wooded with few fields that would be adequate for approach and landing.

The pilot advised ATC to call the Highway Patrol and set up for landing on the highway. There was light traffic in both directions. The pilot managed to get the aircraft down on the straight portion of the road but during the rollout the right wing struck the guardrail on the right side of the road. There was fuel leaking from the right wing not far outboard of the wing root. Fortunately there was no fire. The highway patrol and paramedics arrived about 2 minutes later, and the fire department soon after that. The aircraft was secured, loaded onto a wrecker truck and moved to the nearby airport.

Inspection of the airplane revealed a hole in the left side of the engine case, near the base of the number two cylinder. There was no oil near this hole, and it was determined that this represented secondary damage. On further inspection it was found that the oil cooler hose that attached to a fitting at the top of the accessory case had come apart and there was a tremendous amount of oil all around this area. The hose assembly was a flexible line with stainless steel woven covering. The hose had backed out of the fitting, allowing the engine to pump all the oil overboard. It was determined that the person who fabricated that hose assembly had used an improper fitting for that type of hose and had not followed proper procedures when installing the fitting. The improper hose assembly was impossible to detect on a preflight or even a condition inspection.



Inspecting Unfamiliar Aircraft

When performing the condition inspection on an aircraft it is important that the person performing the inspection be thoroughly familiar with all systems installed on the aircraft. Unfamiliarity can lead to missing something important, as illustrated by the following excerpt from an NTSB accident report...

ACCIDENT NARRATIVE:

The experimental amateur-built Tango 2 airplane experienced at partial loss of engine power while descending in the vicinity of New Port Richey, Florida. The pilot was receiving flight following from the FAA Tampa approach. The pilot made a forced landing to a highway and the airplane collided with mangrove bushes receiving substantial damage. The pilot was not injured.

The pilot had initiated a descent by decreasing power. He subsequently attempted to increase power but the engine did not respond to the power change. The pilot informed the controller of the problem, and the controller provided distance and direction to the nearest airport. The pilot observed a road to his left and informed the controller he could not make the airport and would land on the road. The engine power continued to decrease as the pilot initiated a forced landing on the road. A car pulled out on the road and the pilot attempted to extend the airplane's glide. The airplane collided with man-

grove bushes and came to a complete stop off the side of the road.

EXAMINATION INFO:

Examination of the engine assembly revealed no evidence of a mechanical malfunction. One magneto was installed on the left side of the engine and an experimental electronic ignition system was installed on the right side of the engine. An electronic module with rotating components was installed on the magneto pad, connected to two high tension spark coils mounted on top of the engine. These coils fire the upper spark plugs. There are two wires from the module to each coil supplying the trigger voltage signal to fire the plugs. One of these wires to the right coil, firing cylinder Nos. 1 and 3, had pulled free from a crimp connector.

A wiring harness connects the module to the airframe electrical system and the spark coils. The harness is connected to the module with a "D" plug, held in place with two screws, similar to a computer cable connection. The plug was disconnected from the module and hanging loose. This would cause a complete loss of power to the right hand ignition system, causing a partial loss of engine power as reported by the pilot. *The airframe and power plant mechanic stated he did not check the "D" plug during the airplane's most recent annual condition inspection.* [my emphasis]

Amateur-Built Aircraft Flight Manual Online

Flight advisors are often asked about developing a flight manual for an amateur-built aircraft. While there is no regulatory requirement to have a flight manual or pilot operating handbook (POH) for an experimental aircraft, conscientious builders will endeavor to create one for their aircraft. Some kit/plans vendors offer a POH for their particular design, but when nothing specific to the aircraft is available the builder or pilot has to start from scratch.

It has been suggested that an outline for a POH would be a good addition to the Flight Advisor Handbook. I wouldn't be surprised if many of you already have something that you're using with the EAA members you help. If so, would you be willing to share your outline with the Flight Advisor community? If so, just send it to me here at EAA HQ and I'll make sure it's available to any Flight Advisor who needs it. Send your outline to safetyprograms@eaa.org.



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Horizontal Tail Coefficient

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Cessna 172 and 182 aircraft have exhibited limited elevator effectiveness in the low fuel/full seating/full baggage configuration. I, too, have experienced it on a long flight in a 172 with four passengers and full luggage.

It was a long flight from Chicago to Springfield, IL. We were on our way to a convention and all passengers had briefcases. We started with full fuel and the takeoff was uneventful. When we got to Springfield, we made an instrument approach to the north. On short final over the lights, I ran out of elevator. Clunk-clunk; the elevator ran into the down stops while I was going about 55 kts. This was slower than I wanted so I added a lot of power and put it on the numbers with a sense of relief.

What happened? It was a case of extreme aft CG and running out of elevator. When we landed, the passengers all removed their brief cases from the baggage section. While discussing this with other pilots, I was asked if the weight and balance was checked. I gave the answer that all was within gross weight, but I didn't run the aft CG landing configuration.

In "The Illustrated Guide to Aerodynamics," Skip Smith shows a calculation for Horizontal Tail Coefficient in the section Tail Design:

$$HTC = [\text{horizontal tail area} \times \text{tail arm}] / [\text{wing area} \times \text{wing chord}]$$

The tail arm should be taken from the mean position to the CG. Wing chord is mean chord. For most aircraft this comes out 0.3 to 0.7. Skip Smith says that the Cherokee coefficient is about 0.5. The higher the coefficient, the more elevator authority you have. It's worth knowing where you stand with your airplane. If you are coming in on the low side, take precautions by avoiding far aft baggage.

A flight test can be done with 20-25% fuel and incrementally more and more baggage weight behind the rear seat. You should select a final approach speed on the high side, 1.3 to 1.4 times landing configuration stall speed. This applies to four passenger seating and two passenger tandem seating, like the RV-8.