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Message From Headquarters

Joe Norris, EAA Homebuilders Community Manager

I am writing this in early April but you are no doubt reading it either during the Sun n’ Fun fly-in, or after returning home. I hope many of you had the opportunity to come to Sun n’ Fun, and if so maybe you stopped in and talked with me in the EAA Welcome Center or attended one of my forums. Sun n’ Fun signals the start of another summer flying season, and many folks from the northern climes will emerge from their hangars and shops and turn their attention to flying. (Those of you who have lived in the south all your lives probably wonder what I’m talking about!)

The increase in recreational flying that comes with the transition from winter to spring/summer gives us the opportunity to help our fellow members “brush the rust” off their flying skills. It’s a good time for some recurrent training, especially if you’ve spent much of the winter in the shop or hangar. Sort of a “spring cleaning” for pilots!

With this in mind you’ll note that a considerable amount of this newsletter is devoted

to amateur-built aircraft safety. More specifically, accident data the FAA presented at the EAA/FAA “summit” meetings here at EAA HQ last February. I hope you find this data to be both interesting and informative. Keep this information in mind when you speak to members in your capacity as a Technical Counselor or Flight Advisor. The FAA recognizes our EAA Safety Programs as having a positive impact on amateur-built safety. You all deserve congratulations for your part in this. But we need to continue to work hard to make our amateur-built safety record even better.

This issue also contains a follow-up on my “Found in the Field” article from our last issue, as well as an article that was submitted by EAA Technical Counselor Pete Dougherty. I’m sure you’ll find both of these articles to be informative. As always, I encourage all Technical Counselors and Flight Advisors to submit material for the newsletter. Send your submissions to SafetyPrograms@eaa.org or mail them to me at EAA headquarters.

First Hints for Homebuilders DVD Available

Charlie Becker, Director of Member Programs

Please let your fellow builders know that our first DVD version of our *Hints for Homebuilders* videos, Sheet Metal Vol. 1, is now available. These online videos have been a resounding hit and we have had a number of requests from people with slow or no high speed internet service for a downloadable version of the Hints. To address this request, we created a DVD version of our Sheet Metal Hints for Homebuilders. This eliminates the need for a high speed connection

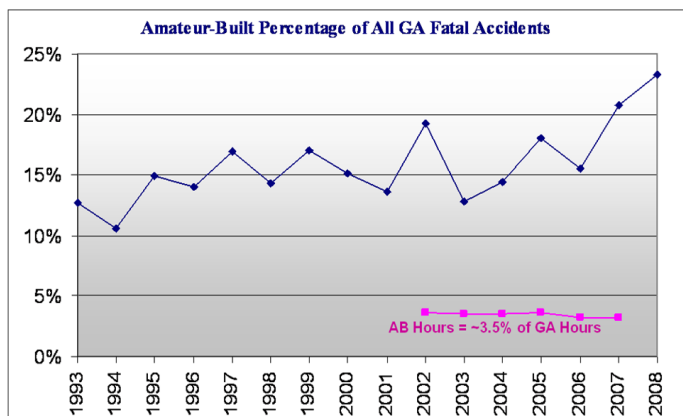
and allows you to watch the video in the comfort of your living room on a bigger screen. I must say that watching it on the big screen was so much better than watching it on my small computer monitor. The price is \$14.95 but if you order before August 2nd, 2009, members will receive an introductory price of only \$9.95. Our hope is that this DVD will be popular enough that we can offer additional *Hints* DVDs on other building topics. To order a copy, call 1-800- 843-3612. The product code is F15604.

Amateur-Built Safety – an Update

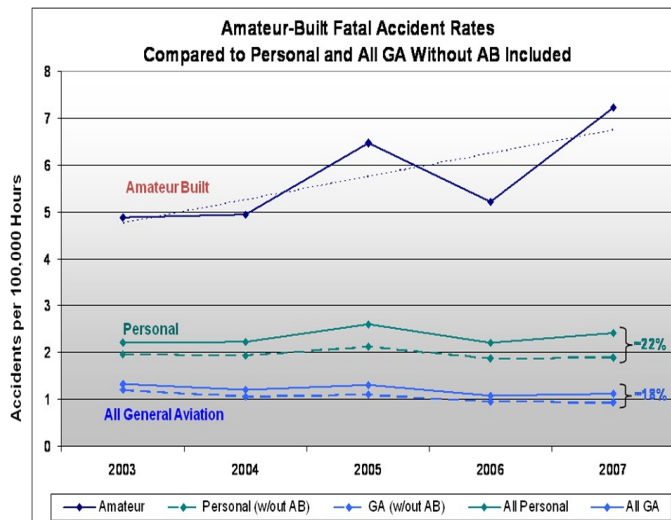
Joe Norris, EAA Homebuilders Community Manager

In February the FAA and EAA met in Oshkosh for what has become an annual “summit” meeting to discuss issues that are of interest and importance to EAA members. One of the main topics of discussion at these meetings has always been safety, with amateur-built aircraft safety being a major part of that discussion. This year’s “progress report” from FAA brings to light some interesting and valuable statistics. Let’s take a look!

You all may remember that this past year marked the major milestone of 30,000 amateur-built aircraft on the FAA registry. FAA reports that this number represents approximately 10% of the total US fleet. However, amateur-built aircraft are involved in almost 25% of the fatal accidents while flying only 3.5% of the total General Aviation flight time.



One of the standard measures the FAA uses when looking at aviation safety is fatal accidents per 100,000 hours of flight time. When looked at in this way amateur-built aircraft have made great improvements over the years, generally getting closer to overall GA numbers each year. But this trend has flattened out and in fact has started to go in the wrong direction in the past few years. The amateur-built rate bottomed out at around 5 fatal accidents per 100,000 hours in the 2003-2004 timeframe (as compared to about 2.3 fatal accidents per 100,000 hours for GA overall in the same timeframe) but has crept up slightly in the last few years. In fiscal year (FY) 2007 the amateur-built rate was just over 7 fatal accidents per 100,000 flight hours after coming in a 6.5 in 2005 and about 5.2 in 2006. These numbers make the trend line move in the wrong direction, which has gotten the attention of the FAA.



The data showed that the number of amateur-built fatal accidents over the last three years were as follows: 47 in FY 2006, 66 in FY 2007 and 70 in FY 2008. The FAA looked at these years individually and collectively, and found many similarities. The main thing that jumps out of the data is that a large percentage of accidents in all three years was due to loss of control; 40% in FY 06, 46% in FY 07 and 47% in FY 08. Also of note is that overall the fatality rate is much higher in amateur-built aircraft. In the FY 06/07 timeframe 27% of all amateur-built accidents were fatal as compared to 18% for GA as a whole.

Finally, the FAA broke down the accident data to identify the accidents by kit producer. They highlighted the top 4 kit lines to see how they compared to the overall amateur-built fleet. Let’s take a look at the data for FY 08:

FY08 Amateur-Built Accidents

FY08 Amateur-Built Accidents (NTSB + Duty Room)

Make	# of Aircraft	% of AB Fleet	# of AB Accidents	% of All AB Accidents	# of AB Fatal Accidents	% of All AB Fatal Accidents	Fatal % of Make's Accidents
Vans	4,548	16.2%	39	14.1%	13	18.8%	33.3%
Lancair	895	3.2%	19	6.9%	11	15.9%	57.9%
Rans	572	2.0%	1	0.4%	0	0.0%	0.0%
Glasair	712	2.5%	2	0.7%	0	0.0%	0.0%
Top 4	6,727	24.0%	61	22.0%	24	34.8%	39.3%
All AB	28,029		277		69		24.9%
AB less top 4	21,302	76.0%	216	78.0%	45	65.2%	20.8%

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Fuel Line Sizing

Pete Dougherty TC #5337

Sizing fuel lines for small aircraft is a subject that is hard to give a standard answer to that will apply to every project. Most of the time fuel line requirements should already be figured out for you by the designer of the aircraft. What I have seen in the field is that generally, if the engine is rated at, say 50 hp it would have 1/4" fuel lines. If it was 65-180 hp it would usually have 3/8" fuel lines. And so on. Again, these are general numbers and what you really need to know is that there is going to be enough volume of fuel delivered to the carburetor at the right pressure. The following are some FAR Part 23 guidelines for certificated aircraft that may be helpful for the homebuilder as a guideline.

The size of the fuel lines in a typical single engine light aircraft are determined by the fuel consumption rate of the engine. The lines in a gravity feed system need to be large enough to supply at least 150% of the fuel consumption of the engine at full power. A pressurized fuel system (i.e., a system using fuel pumps) needs to be able to supply at least 125% of the fuel consumption at full power. (AC 90-89A pg 23)(14 CFR 23.955) The formula for fuel flow rate in a gravity feed system is $.55 \times \text{engine horse power} \times 1.50 =$ pounds of fuel per hour divided by 60 to get

pounds per minute divided by 6 to get gallons per minute. In a pressurized system simply substitute 1.25 for 1.50.

The line size will vary per installation depending on a number of factors including how high the fuel tank is above the carburetor inlet and what kind of restrictions are in the line (filters, screens, valves, sharp bends in the lines, etc.). Generally, if the flow is not high enough the line size needs to be larger, but if the pressure is not high enough either the height of the fuel tank above the carburetor needs to increase, or a fuel pump needs to be added to the system.

AC 90-89A is available here:

[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/d08fa9393154b636862569ba006f6d7f/\\$FILE/ATTLMVEO/AC90-89A.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/d08fa9393154b636862569ba006f6d7f/$FILE/ATTLMVEO/AC90-89A.pdf)

All new and old Advisory Circulars are available here:

http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/MainFrame?OpenFrameSet

Amateur-Built Safety – an Update (Cont.)

Joe Norris, EAA Homebuilders Community Manager

You can see how the numbers track for the various kit producers, and also how these numbers compare to the overall fleet. Note also that the overall fleet numbers are given both with and without these top 4 producers included.

The main issue FAA has focused on is how the numbers for the Lancair designs stand out from the rest. Lancair designs comprise only 3.2% of the homebuilt fleet, but are involved in 6.9% of the total accidents and almost 16% of the fatal accidents. Even more notable is that almost 60% of Lancair accidents are fatal. These numbers have caused the FAA to take a closer look at Lancair designs, and have also had a hand in the formation of the Lancair Owners and Builders Or-

ganization (LOBO) that was featured in your last issue of Safety Wire.

The FAA has formed a committee to look at amateur-built safety, and EAA is participating in this effort. You will see reports on this from time to time, either here in Safety Wire or in other EAA publications. The FAA recognizes that EAA's Technical Counselor and Flight Advisor programs do have an impact on amateur-built safety, and it's up to all of us to spread the word about the value of these programs. Improving the safety record of amateur-built aircraft is something we all can help with, and will help to protect the privileges we've earned over the years. Keep up the good work!!



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Found in the Field Revisited

Joe Norris, EAA Homebuilders Community Manager

In the last issue of *Safety Wire* we published an excerpt from an article that originally ran in EAA Chapter 818's newsletter. The article talked about maintenance and inspection of new production Light-Sport Aircraft (LSA). We received some feedback on that article directly from the FAA's LSA team at the Small Airplane Directorate in Kansas City, MO. The issue they were concerned with was the following statement from the article:

"The use of clamps and standoffs in the engine compartment to protect wires and tubes and the appropriate use of rubber grommets to protect wires and tubes running through panels was noted as being good maintenance practice. It was suggested that, when dealing with factory-built LSA this should not constitute a modification to the manufacturer's design needing approval by the aircraft manufacturer."

The FAA folks pointed out that ANY change to a LSA that is not specifically covered in the manufacturer-supplied maintenance manuals or other documentation must receive manufacturer approval

before it can be incorporated on the aircraft. This includes such seemingly simple things as installation of rubber grommets, clamps or standoffs. Regardless of whether we might consider such installations "best practices" or how minor they seem, there must be factory documentation to support the installation or repair.

Many FAA inspectors in the field, as well as many well meaning A&P mechanics do not fully understand the regulations as they apply to these new light-sport aircraft. The FAA folks from the Small Airplane Directorate wanted to point out this issue so that EAA Technical Counselors can help educate others about the correct procedures for these aircraft.

