EAA
SAFETY WIRE
FLIGHT ADVISOR AND TECHNICAL COUNSELOR NEWS

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Your EAA Staff Resources:

Jennifer Bork
Safety Programs Administrator
safetyprograms@eaa.org
888-322-4636 ext. 6864
920-426-6864

Joe Norris
Homebuilders Community Manager
jnorris@eaa.org
888-322-4636 ext. 6806
920-426-6806

Charlie Becker
Director –Member Programs
cbecker@eaa.org
888-322-4636 ext. 6530
920-426-6530

Member Line
888-322-4636
info@eaa.org

Inside this issue:

Message From Headquarters

Joe Norris, EAA Homebuilders Community Manager

I'm sure you've all seen EAA President Rod Hightower's "Tower Frequency" column in the January 2011 issue of *Sport Aviation,* in which he talks about the FAA's new effort to "Transform GA". This is going to be a major effort for FAA, and thus will be a major focus of EAA's advocacy efforts for the foreseeable future.

A big part of the FAA's plan is a reduction in fatal accidents in homebuilt aircraft. That's where you all come in. EAA has always promoted the Flight Advisor and Technical Counselor programs as significant in reducing homebuilt accidents. We will continue to promote our Safety Programs to the FAA as a major tool affecting homebuilt aircraft safety. I ask each and every one of you to redouble your efforts on behalf of your fellow EAA members and the homebuilt aircraft community at large. If we don't have a measureable effect on the homebuilt aircraft fatal accident rate in the near future the FAA will apply their own methods of affecting change. These methods could include changes in homebuilt aircraft operating limitations or changes in the amateur-built regulations themselves. I'm sure you agree with me that we would rather find our own solutions and not have the FAA try to find them for us.

The good news is, you will soon have a new tool to use. Over the course of this past year EAA participated in an FAA "Flight Standardization Board" addressing homebuilt safety, specifically with an eye toward pilots transitioning into aircraft they are not familiar with. The outcome of this FSB will be an FAA Advisory Circular aimed at transitioning to unfamiliar aircraft. We are looking to our Flight Advisors and Technical Counselors to get the word out about this new AC once it is available later this year.

I can't emphasize enough how important this effort is. We (EAA members and the entire homebuilt aircraft community) need to make every effort to reduce accidents, especially fatal accidents, so that we can avoid having the FAA step in and apply their own solutions to the issue.

Speaking of safety, this month's issue of *Safety Wire* includes a new FAA SAIB on the subject of maneuvering speed and abrupt control inputs. This SAIB stems from the accident investigation of the airliner that lost its vertical tail and crashed shortly after takeoff in turbulent weather. The info brought out by this SAIB is applicable to all aircraft and operations. I encourage you to share this info with your chapter and fellow EAA members.

As always, I will close with my usual plea for newsletter submissions from the field. If you've written a short article for your chapter newsletter or other publication please share it with your fellow Technical Counselors and Flight Advisors. 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

FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: CE-11-17
Date: January 18, 2011

SUBJ: Instruments

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin informs you of an airworthiness concern that is relevant to all airplanes certificated under Title 14 of the Code of Federal Regulations (14 CFR) part 23, as well as those certificated under the previous Civil Air Regulations (CAR) part 3. This information is also relevant to any special light-sport category airplanes (S-LSA), experimental light-sport airplanes (E-LSA), and experimental amateur-built airplanes.

At this time, the Federal Aviation Administration (FAA) has determined that this airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under 14 CFR part 39.

Background

On November 12, 2001, American Airlines Flight 587, crashed shortly after takeoff from New York's John F. Kennedy International Airport. The crash killed all 260 people aboard and 5 people on the ground. The National Transportation Safety Board (NTSB) determined "the probable cause of this accident was the in-flight separation of the vertical stabilizer as a result of the loads beyond ultimate design loads that were created by the first officer's unnecessary and excessive rudder pedal inputs." As a result of this accident and subsequent investigation, it was revealed that many pilots have a misunderstanding of what the design maneuvering velocity (speed), V_A, represents. Many pilots believe that as long as the airplane is at or below this maneuvering speed, they can make any control inputs they desire without any risk of harm to the airplane. This is not true.

The design maneuvering speed (**V_A**) is the speed below which you can move **a single** flight control, **one time,** to its full deflection, for **one axis** of airplane rotation only (pitch, roll or yaw), in **smooth air**, without risk of damage to the airplane.

Even though the accident discussed above is a part 25 airplane, V_A is applicable to part 23, CAR 3, and LSA airplanes. Also, even though experimental airplanes may not have a published V_A , they will still have some maximum maneuvering speed associated with the maximum structural design loads. Therefore, the pilot should be aware of what speed this is, and adhere to the guidance herein. The regulations governing the design strength requirements for airplane structure require adequate strength for full control deflection (below V_A). However, they do not require the manufacturer to make the airplane strong enough to withstand full control input followed by a full control input in the opposite direction, even below V_A. Neither do they require the manufacturer to design the airplane for more than one simultaneous full control input such as full ailerons with full elevator and/or rudder.

V_A, as published in the airplane flight manual (AFM) or pilot's operating handbook (POH), is valid for operation at the gross weight stated, which is typically at max gross weight. It is especially important to note that V_A decreases as the airplane weight decreases. At first, this may seem counter intuitive. All pilots understand that when the airplane is subjected to an external force, such as the

aerodynamic force from a control surface, the airplane responds by accelerating (rotational acceleration) about one of the airplane's axes. This was stated many years ago in Newton's Second Law of Motion. The law states that when an object of mass 'm' is acted upon by a force 'F', it will undergo acceleration 'a' in the same direction as the force. More simply stated in the widely known equation "F = ma", which can be rewritten as "a = F/m". Rewritten this way, it is clear for a given control force 'F', as the airplane weight 'm' decreases then the acceleration 'a' will increase. This higher acceleration gives rise to higher loads on the airplane structure. Therefore, as the airplane weight decreases, the allowable maneuvering speed must also decrease, to ensure that the airframe is not damaged. Pilots may remember from their written exam that $V_{A\text{-}NEW} = V_A \sqrt{(W_{NEW}/W_{MAX\text{-}GROSS})}$ as the way to calculate the corrected (new) maneuvering speed due to operating at a weight less than the maximum gross weight. NOTE: This formula is for calculating the V_A change about the pitch axis; however, it can be used for all axes.

Recommendations

The FAA wants to clarify that operators should know what the maneuvering speed is and to caution pilots on what to avoid by adhering to the information described above and contained in the regulations. We recommend the following for maneuvering at, or even below, V_A:

- DO NOT apply a full deflection of a control, followed immediately by a full deflection in the opposite direction.
- DO NOT apply full multiple control inputs simultaneously; i.e., pitch, roll and yaw simultaneously, or in any combination thereof, even if you are below V_A.
- Reduce V_A when operating below gross weight, using the following formula:

$$V_{A\text{-}NEW} = V_A \sqrt{(W_{NEW}/W_{MAX\text{-}GROSS})}$$

For Further Information Contact
Mark James, Aerospace Engineer, 901 Locust, Room 301, Kansas City, MO 64106; phone: (816) 329-4137; fax: (816) 329-4090; email: mark.james@faa.gov.

Nominations Sought for Bingelis, Spirit of Flight Awards

Is there an extraordinary tech counselor in your chapter? Or a pilot whose accomplishments and dedication to aeronautics have "flown under the radar"? Perhaps they may be appropriate recipients for two awards presented annually at EAA AirVenture Oshkosh – the Tony Bingelis Award and the Spirit of Flight Award.

The Bingelis Award honors the memory of Tony Bingelis, EAA's highly regarded homebuilding authority, author, and columnist for *EAA Sport Aviation*. Created in 2002, the award recognizes people who have made significant contributions to the encouragement of aircraft projects for fellow EAA members, the promotion of safety, and maintaining the values of EAA. A nominee must have been an active and current EAA technical counselor for five consecutive years. A nomination form can be found at: http://members.eaa.org/home/homebuilders/awards/bingelis_form.pdf

The Spirit of Flight Award was established in 1997 by the Society of Experimental Test Pilots and Scaled Composites to recognize an EAA member who best exemplifies the spirit of research, development, or flight testing. The member promotes air safety by presenting a pilot's opinion, strengthening the influence of the test pilot on aeronautical progress, and continuously evaluating the adequacy of flight equipment. A nomination form can be found at: http://members.eaa.org/home/homebuilders/awards/spirit_form.pdf

If you have any questions, please call the EAA Safety Programs Office at 888-322-4636, ext. 6864.

EAA
Safety Programs
PO Box 3086
Oshkosh, WI 54903-3086

Phone: 888-322-4636 ext. 6864
Fax: 920-426-6579
Email: Safetyprograms@eaa.org

Mailing Address Line 1
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We Need Your Help!

Joe Norris, EAA Homebuilders Community Manager

As I mentioned in my "Message from HQ" this month, the FAA is keenly focused on the safety record of homebuilt aircraft. EAA is working with the FAA to find ways to reduce the fatal accident rate for homebuilt aircraft while at the same time protecting the homebuilt community from any additional regulation or loss of privileges. We have always championed EAA's safety programs as a major tool in combating homebuilt accidents. The success of the EAA Designee program, now called the Technical Counselor program, back in the 60s and 70s led to the FAA's removal of the requirement for specific pre-cover/pre-closure inspections. On the flying side, we can show that no aircraft that has been involved in the Flight Advisor program had been involved in a fatal accident during the flight test period.

While these programs obviously work, their success is limited by their underutilization. There are typically 1000+ new homebuilt aircraft added to the FAA registry each year, yet there were only 62 Flight Advisor reports recorded at EAA HQ last year. Even if you assume that only 750 of those newly-registered aircraft actually made their first flight last year, the Flight Advisor program still has less than 10% participation. While the Technical Counselor program enjoys a bit better utilization, there were still only a little over 1000 activities recorded by Technical Counselors last year, and this includes all TC activities, not just project visits. You can easily see that we have room for improvement in both programs.

This is where you come into the picture! I am asking you to do two things. First, please make sure you record and report ALL of your Technical Counselor and Flight Advisor activities. It is important that we have an accurate picture of just how much utilization these programs enjoy. Accurate reporting will help us to make our case that we have good programs in place that will have a positive impact on the homebuilt safety record. Second, I want to hear your ideas on how we can promote more utilization of these programs. Please submit any ideas you may have about rewards, recognition, or other ways of broadening participation in EAA Safety Programs. You can send your ideas to me via email at jnorris@eaa.org or you can give me a call at 920-426-6806. Of course you can also use the good old US Postal Service as well. Just send your ideas to my attention at the EAA Aviation Center, P.O. Box 3086, Oshkosh, WI 54903. I look forward to hearing from you!