

## Calendar

### January

**3** EAA Chapter 1129  
**Regular Meeting.**  
Tamarack Air Hangar,  
6:30 pm

### February

**7** EAA Chapter 1129  
**Regular Meeting.**  
Tamarack Air Hangar,  
6:30 pm

**22** EAA Chapter 1129  
**Annual Banquet,**  
Pikes Waterfront Lodge,  
Syd Stealey is the speaker!

### REMINDER for Winter Meetings:

The meeting is **CANCELLED** if the temperature at the airport at 5 p.m. is **-30°F** or lower. Call **458-3745**, then enter **1113**.

EAA Chapter 1129  
Web Site:

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Next Meeting:

**When: Thursday, January 3 at 6:30 pm.**

**Where: Tamarack Air Hangar at 3900 University Ave S.**

**What: Jim Woolace, North Pole Propeller, will talk about propeller balancing**

## President's Hot Seat

*Rick Crisenbery*

Last month I mentioned that the planning for the banquet was starting and now we have made some decisions on that. Syd Stealey has consented to be our speaker and I am sure he will present a program that all of you will enjoy. Please help spread the word about this as we would like to see a full house to welcome Syd.

We will be having a banquet planning meeting in the next couple weeks so I will be asking for help at the general meeting. We will need people to contact business for silent auction donations and to help with advertising.

At the general meeting last month several members volunteered to help on the strategic planning committee. If you would be interested in this please contact Mark Molino, the chairman of the committee, or myself. Also Terry Wighs volunteered to be the new Young Eagles coordinator. Terry was very active in the Young Eagles program in his former chapter. We look forward to having him with us.

Hope to see all of you at our next meeting on January 3<sup>rd</sup>.

## Changes to the Rules

*Mark Morlino*

Prior to a change in December 2012 it was required that baggage entering the US on international flights was re-screened by TSA before being loaded onto connecting flights. The baggage had already been screened and never removed from secure areas so screening it again provided no benefit.

It is difficult to predict what changes to aviation regulations might occur in

*EAA Chapter 1129 Mission Statement:*

**Build, restore, innovate and educate to preserve Alaska's aviation heritage, and to promote Alaska's aviation future.**

2013. Perhaps this will be the year when pilots will be able to self certify to fly without a 3rd class medical certificate. Of course this would not be without restriction: the flight must be VFR, during the day, for recreation, flown in a single engine, fixed gear, less than 180 hp airplane with no more than one passenger (or whatever the finalized rule might say). This is one rule change that would likely be welcomed by a large number of pilots.

In August of 2012 the FAA quietly issued a "Notice of policy; request for comments" regarding "Passenger Use of Portable Electronic Devices On Board Aircraft." The request for comments came out the day after my son was born so I was more focused on my immediate surroundings than national news but I don't believe it received much media coverage outside of aviation specific channels. Unfortunately, I did not learn about it until after the comment period had expired. Recently, there has been some related news about a petition launched by George Takei (the actor who played Sulu in the original Star Trek) that addresses the same issue of portable electronics used by passengers. As of a few days before Christmas he had gathered almost 20,000 signatures.

From my perspective I would like to see the FAA do something in 2013 to facilitate transition training for experimental amateur built aircraft. It is currently possible for a CFI to obtain a LODA (Letter of Deviation Authority) to offer type-specific training in their experimental aircraft. Instructors in 28 states have done this according to a list maintained by the EAA, <http://www.eaa.org/govt/loda.asp>. There are currently none listed in Alaska. This type of training is becoming more and more important with the increasing popularity of kit airplanes. Some simple changes to the rules would make transition training much easier to get for builders and buyers of experimental aircraft.

Change is inevitable and I'm hoping that whatever changes do occur in 2013 will be positive.

## It's Ski Time

*Vickie Domke and John Zarling*

At our last general meeting Vickie did a "Show and Tell" on rigging skis on an aircraft. I have recently assisted an owner with some engineering in order to seek approval to install skis on his aircraft. So, we decided to pass along in the newsletter some of our experiences.

If you intend to have skis installed on your certificated aircraft a good place to start is to download the Type Certificate Data Sheet, TCDS, for your aircraft from the FAA website. For example, there are over 30 different model skis eligible for installation on a BC12D Taylorcraft, yet there are no skis listed as eligible on the F21B Taylorcraft. If you do not find skis listed for your aircraft on the TCDS then next see if you can find any STCs available for installing skis. The FAA website is a good place to start this search. Failing here means you will need to get a "field approval" from the local FAA FSDO to install skis. My recent experience was the FAA required a coordinated field approval meaning engineering review by the Anchorage ACO was needed.

There is valuable information on installing skis in the CARs and FARs. For example, FAR Part 23.505 states: "In determining ground loads for ski-planes, and assuming that the airplane is resting on the ground with one main ski frozen at rest and the other skis free to slide, a limit side force equal to 0.036 times the design maximum weight must be applied near the tail assembly, with a factor of safety of 1." For a BC12D-85 Taylorcraft the maximum weight of the aircraft is 1280 pounds and the distance from the rear lifting handle to line passing through the main gear axles is about 153 inches. The side force would be  $0.036 \times 1280$  pounds or 46 pounds applied at the tail of the aircraft resulting in a moment (torque) of about 7,040 inch-pounds at the axles. This moment would be applied to the landing gear-ski that is frozen to the ground. Extreme care should be exercised when moving a ski plane that has

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been stationary long enough for the ski(s) to become "frozen" to the snow surface. Elevating the skis by blocking, or decoupling the ski bottoms from the snow with plastic sheeting or evergreen bows will help prevent the skis from becoming adhered to the snow surface. On sunny days in March the sun usually warms the ski enough to break the bond.

For rigging skis AC 43.12-2B Chapter 5 has a wealth of information. Additional guidance should be available from the ski manufacturer and the STC if it applies. 43.13-2B recommends 5/32 inch cable for ski limit loads of 1,500 to 3,000 pounds. Fittings (tabs) for 5/32 inch cable should be at least 0.080 inches thick and made of 1025 steel or its equivalent. Atlee Dodge offers ski tabs made of stainless steel that are 0.125 inches thick and one inch wide with 0.375 inch diameter holes on each end.

41.13-2B also provides recommended positive (up) and negative (down) angles for the installed ski. Reference should also be made to the manufactures and/or the STC's recommendations on these angles.

Aircraft grade hardware should be used for rigging the skis. Aircraft grade cable has a red thread woven into the cable. Galvanized and stainless steel cables are available; however galvanized cable is less expensive and stronger. Our observation is that the majority of ski installations use galvanized cable. Proper

size AN100 thimbles and Nicropress sleeves are also required. With galvanized cable, copper sleeves are used; however stainless steel cable requires the use of tin plated copper sleeves to reduce corrosion potential.

Most mechanics start assembling the cables on their workbench. They begin with about four feet of cable for the rear check cable and seven feet of cable for the front cable. Typical steps are:

- Swage cable sleeve with thimble installed on tab on one end of each rear cable.
- Swage cable sleeve with thimble installed on each ski spring to begin front cable assembly.
- Swage second cable sleeve with thimble installed on tab for attachment on aircraft. A length of about eight inches of cable between the end of the spring and the tab is recommended by the Atlee Dodge STC.
- Feed remaining cable through the spring.

A "go/no-go" gauge is used to check the quality

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of all swages. If you are in the market for a swaging tool, make sure it will swage 5/32 inch sleeves. For 5/32 inch cable three swages are required on each sleeve. The first swage is done on the center of the sleeve, the second swage is done on the thimble end and the last swage on the opposite end.

The skis and cables are then installed on the aircraft. A thimble and sleeve are swaged onto the tab attached to front of the ski for the safety cable. The length of the cable is adjusted to achieve the required negative angle on the ski. The Atlee Dodge STC for steel springs provides a negative angle of the ski with the plane sitting in its three point position. Mechanics find by using of a couple of small Vise Grips, cables can be held to proper lengths during swaging.

Next the tail of the aircraft is raised until a "level" attitude is achieved. The TCDS gives the proper location of measuring this attitude. Rear check cable lengths are adjusted to achieve the proper positive ski angle and the thimble and sleeve are then swaged onto the tab attached to the rear of the skis. A Smart Level is an invaluable tool to have in doing the rigging. Measuring the attitude angle with the aircraft in its three point position and calculating proper angles to hold the skis with the front of the aircraft lifted is an alternative approach to determining cable lengths.

The last step is to attach the front cable already attached to the front ski tab to the spring. This requires tensioning the spring to achieve the tension forces listed in AC 43.13-2B. For ski limit loads between 1,500 and 3,000 pounds, a tension of 20 to 40 pounds is required. One way mechanics do this is by attaching an AIH turnbuckle to the spring and ski tab and increasing the tension on the spring until a downward force within the required range is achieved. Then the thimble and sleeve are swaged on at the spring with the cable held taut with the Vise Grips. A picture of the turnbuckle set-up is shown.



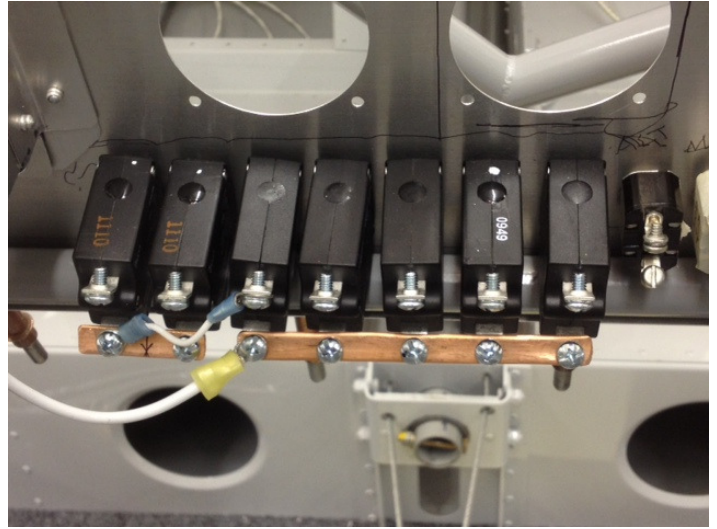
AC43.13-2B states "the shock cord tension must also be sufficient to return the skis to the normal flight attitude from their maximum negative incident at all airspeeds up to the airplane's never-exceed speed with skis installed. In the absence of more precise data, each shock cord must be able to produce a nose-up moment about the ski pedestal bearing centerline of  $M = (0.0000036)WV_{NE}^2$  ft-lbs when the ski is at its maximum negative incidence where  $W$  is the maximum certificated gross weight of the airplane and  $V_{NE}$  is its never-exceed speed with skis installed". (Note: this equation was mistyped – it should be  $M = (0.0000036)WV_{NE}^2$  i.e.  $V_{NE}$  should be squared)

AC43.13-2B states not to rely on these tension force values for main ski installation on airplanes with spring steel or other flexible landing gear. Shock cord tensions great enough to meet the downward forces listed in Table 5-2 of 42.13-2B may produce excessive toe-in of the main skis on such airplanes.

For a Taylorcraft BC12D-85 the never exceed (glide or dive) speed is listed as 142 mph. The moment  $M$  is equal to 93 foot-pounds at the 1,280 pound gross weight. The distance from the axle centerline to the ski front cable tab is about 3 feet on Federal A1500A skis and therefore a force of 31 pounds perpendicular to the ski at this ski tab is required at the maximum negative angle. The actual force is measured by lifting the nose of the aircraft and with a spring scale pulling downward perpendicularly on the nose of the ski at the front ski cable tab

until the maximum negative angle is reached and the force is observed. If the spring scale is attached at the nose of the ski, the force will have to be calculated based on the new moment arm.

Rigging of skis on certificated aircraft requires a licensed mechanic. However, an owner with some training can remove and install skis. A revised weight and balance is required when installing skis.



## Building Tip

Last month Phil Schaefer told us about Jack Schnurr's tip to fabricate a buss bar with the correct hole spacing. This month Jack sent us a photo!

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