

EAA CHAPTER 80 NEBRASKA IOWA



News!

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October 2009

President

Tom Wieduwilt
402-734-6580
teiwied@cox.net

Vice-President

Jim Ratte
402-964-2645
jrnuke@cox.net

Secretary

Don Meyer
402-650-2551
airmeyer1@cox.net

Treasurer

Ed Haffke
402-935-0803
ehaffke@gmail.com

Membership Coordinator

Bob Cartwright
402-895-0125
robertc@novia.net

Tech Counselors & Flight Advisors

Bob Harvey
402-289-2991
bharvey91@peoplepc.com

Mike Howard

402-991-0403
acepilot59@cox.net

Librarian

Leonard Lawton
712-526-2198
ldlawton4me@aol.com

Young Eagle Coordinator

Jim Ratte
402-964-2645
jrnuke@cox.net

Newsletter Editor

Will Kroeger
402-331-3887
pilotwill@cox.net

WebSite Manager

Ameet Savant
402-516-4546
ameetsavant@Yahoo.com

Some Common Mistakes

By

Dave VanDenburg, EAA Chapter 439 Technical Counselor

One of the really great things about being a Technical Counselor (and DAR) is the opportunity to look at a lot of amateur built aircraft. I am routinely impressed at the excellent workmanship and innovation demonstrated, and often a little jealous. Sometimes however, I see things that are not quite "according to Hoyle". This is to be expected as most homebuilders are not Airframe and Powerplant Mechanics and are not always aware of the "preferred" methods of building. I thought this month I would discuss some of the more common mistakes I see, and demonstrate the proper procedures. After all, our aircraft are required to be in a safe condition for flight and to meet common aeronautical construction practices.

Probably the biggest problem area I find involves hardware. More specifically, I find bolts that are too long, (or too short), cotter pins improperly installed, missing safety wire, self locking nuts installed so as to be subject to rotation, and low temperature (nylock) self locking nuts installed in a high temperature environment. Allow me to discuss some of these in a little more detail.

As you are probably aware, most AN and MS standard aircraft bolts have a long, unthreaded "grip length" and a relatively short threaded area. They come in 1/8 inch increments and are designed so that when properly tightened, we should have a minimum of one thread, and a maximum of three threads protruding from the nut. It is very important we follow this guidance, because less than one thread showing may defeat the self locking feature of some nuts, and more than three threads showing means we are probably tightening the nut against the unthreaded "grip" of the bolt and not achieving the proper joint preload. Bolts that are too long should be replaced with the next size shorter. Alternatively we could add washers under the head and/or nut to achieve the correct number of threads showing, up to a maximum of three washers.

Another common mistake I see is incorrectly installed cotter pins. I suppose you could make the case that any method of bending a cotter pin is good so long as the nut cannot come off. In fact, I remember my younger days on the farm where we often just drove a nail through the hole in a bolt or shaft to keep a whole mess from falling apart out in the "back forty". This worked but was a real pain when it came time to remove the part. As aircraft builders however, we can do better and I would encourage you to use a cotter pin and one of the two "approved" methods of installing it.

The preferred method is done by inserting the cotter pin through the hole in the bolt and bending the two legs. One leg is bent up and over the end of the bolt while the other leg is cut short and bent flat against the flat of the nut.

The other "approved" method of installing a cotter pin is to simply bend one leg around each side of the shaft (or a nut). We all tend to use self locking "nylock"(AN 365) or the higher temperature all steel (AN 363) nuts wherever we can. These little rascals work great and avoid



Rod Combs, former US Army Helicopter Test Pilot, discussing Helicopter Operations, training and flight safety at the Sept 2009 meeting.

Photo by Dick Austin

the problem of aligning the cotter pin hole in the bolt with one of the channels in the castellated nut. Unfortunately, there are a couple of areas where they should not be used.

For example, the common nylock nut gets its self locking feature from a thin plastic insert which grips the thread of the bolt. These nuts are only to be used at temperatures up to 250 degrees F, as higher temperatures will soften this collar and defeat the self locking feature. Obviously this nut should not be installed on high temperature areas of our engines (such as exhaust risers) or in the higher temperature areas of our engine compartments, such as close to the exhaust system.

Another area where self-locking nuts are inappropriate is on any joint subject to rotation. The relative motion of these surfaces can loosen the nut and result in some unwanted in-flight excitement. If a joint is subject to rotation, we should use a castellated nut (AN 310) and cotter pin. This rule does not apply if the nut is tightened against an antifricition bearing or bushing that allows rotation of the parts without applying a rotational force to the nut.

The last common hardware mistake I want to discuss here is the lack of safety wire. Some people think safety wire is simply installed so we can recover our hardware or part for reinstallation once it falls off. I prefer to think that safety wire is used to prevent the part from falling off in the first place, and again avoiding that unwanted in-flight excitement.

One area commonly missed is the main fuel filter (commonly called a "gascolater") bail. This is the part that holds the sediment bowl on to the filter body and is obviously very important. If the bail was to come loose in flight allowing the sediment bowl to separate, your expensive fuel would quickly depart the aircraft and you would soon land, whether you intended to or not.

Another common area often missed is the oil drain plug and suction screen on the oil sump. Loss of either of these plugs will quickly result in loss of most of your engine oil, and again, more unwanted in-flight excitement. These are often missed after an oil change, so be sure to double check your work, or, better yet, get a second set of eyes on the completed job.

Once in a while I also see a few turnbuckles that are not properly safety tied. Again, once the job is complete recheck your work to insure everything is tight and appropriately safety tied so that it will stay that way. As always, the Advisory Circular AC 43.13-1B is available online at www.FAA.gov and from your favorite aircraft supply store, and will guide you through the process. Or call your Technical Counselor, that is why we are here.

Fly safe and keep building!

I thought the Chapter needed a break from my comments and would appreciate some light technical stuff. Since I am not a nuts & bolts guy, I borrowed an article from a friend in the UP. Will

October Meeting Time & Location

This month's meeting is on Monday Oct 12th at 7:00PM at Hangar One at Millard Airport. The airport is still located on South 132nd Street between Q and Harrison.

October Program.

Our guest speaker this month comes all the way from

California. Ron Burgher is the founder and owner of the web service FlythePattern.com. This site offers pilots the opportunity to see pictures and landing pattern videos of an airport they may flying to. Question - how did Jim get him here? Must have promised warm, clear and dry weather.

Nov... meeting to be held at the Strategic Air and Space Museum at 6:30. We are hoping to get an update on the museum, tour the restoration facility and the B29. We will bring in refreshments and forgo the business part of our meeting. The museum is essentially open to us that night as a thank you for our work these past 3 years supporting their summer education programs with Young Eagles flights.

Dec... **Our annual Christmas Party** at Piccolo's on the 14th. Please respond to the ping invite or call Jim Ratte with the number in your party and dinner choices (8 oz Prime Rib or 8 oz Filet or Chicken Breast or Baked Halibut). Party timeline is: 6-7 social; 7-8 dinner; 8-9 program. We will introduce the new Chapter Officers, have a Cash bar, Poinsettias for the ladies, music and raffle prizes. Tickets will be \$30 per person.

EVENTS:	(B) - Breakfast / (L) - Lunch	
1st Sat	Chapter 1055 (B) (0800-1000)	York, NE
3rd Sat	Chapter 569 (B) (0800-1000)	Crete, NE
4th Sat	Aviator's Breakfast (0800-1000)	Chadron, NE
Oct 10	EAA Chapters of Iowa Open House and Fly-In	
	Ames, IA 8:00 am - Noon	
	FAA Safety Seminar @ 8am	
Oct 17	Aircraft Electrical Seminar	Mason City, IA
	See last months newsletter for details	

YOUNG EAGLES — Plattsmouth Airport
13 Sept (Sunday) 0900
Millard Airport 17 Oct 0900
Call Jim Ratte or Kathy Callahan (or answer the ping) if you can help.

Order your EAA World of Flight 2010 calendar at the October Chapter meeting. Call any Chapter officer if you want one but can not make the meeting.



Larry Lumpkin in Gunfighter, and Harlon Hain in his Comanche 260, taken at Plattsmouth on Sept 13th at the YE event. Photo by Dick Austin

EAA Chapter 80
September 14, 2009
Official Meeting Minutes

The meeting was called to order by President Tom Wieduwilt at 7:00 PM. Meeting was held at Hanger One, Millard Airport, Omaha, NE.

- Tom Wieduwilt, President
- Jim Ratte, Vice President,
- Don Meyer, Secretary
- Ed Haffke, Treasurer

Treasurers Report:

- Operating Account: \$2,583.73, Money Market Account \$4,824.79, CD Balance: \$2,990.81. Total Cash Assets: \$10,399.81.

Meeting Minutes:

- A motion was made and passed to accept the previous month's minutes.

Young Eagles:

- 54 YE flown at Plattsmouth on Sept. 13th. 376 YE flights for the year.
- CAP event in Freemont, NE Sept. 20 at 9:30. Need pilots to fly YE.
- Next event at Millard, NE on October 17th.

Builder's Reports:

- Larry Geiger started building an RV-12.
- Chris Halfman working on center fuselage on his RV-7.
- Bob Condrey's RV-10 back from paint shop.
- TW RV-6 working on control surfaces, installed prop.
- Bob Soukup received Best of Show at Minden, NE for his Piper Colt.
- Steve Ousley also received an award for his Glstar at the Minden event.

Tech Counselor / Flight Advisor:

- None

Fly-Out Report:

- Oct. 4th Poker run and chili feed at our hanger in Wahoo, NE (AHQ)

Old Business

- None

New Business:

- November Meeting will be at the Air and Space Museum. The evening will be for our chapter and guest only. Contact Jim Ratte with your plans to attend.
- Chapter Christmas Party will be 12-14-09 at Piccolos Resturant. \$30.00 each and please sign up for this event.
- Officer nominations for next year are:
 - Jim Ratte-President
 - Bill Stromenger-VP
 - Don Meyer-Secretary
 - Ed Haffke-Treasure
 - Leonard Lawton-Membership Coordinator
- Nominations are still open.

Librarian Report:

- None

Membership Report:

- None

Tool Report:

- Engine hoist in Ronye McKay's hanger
- Trailer: AHQ
- Scales: TW
- Jacks: Ron Wood
- Brake Bleeding Set: Ron Wood
- Grills: At AHQ

Web Site:

- www.eaa80.org

Program:

- Rod Combs shared his experience as helicopter pilot, safety officer, and test pilot for 27 years in the US Army. He currently presents safety seminars and led a very interesting discussion regarding flight safety.

Meeting adjourned.

Don Meyer
Secretary

There are still a lot of good flying days left in the year. Call Ron Wood if you need a plane to fly or are looking for a less expensive way to fly. He is selling his Cessna 150 for \$17,000. Contact him at 402-333-7160 or rwood90641@aol.com



Experimental Aircraft Association -
Chapter 80 C/O Hangar One
12916 Millard Airport Plz.
Omaha, NE 68137-4280



Bob Condrey's RV-10

Larry Geiger's RV-10

Photos By Dick Austin

I wonder why Dick did not take a picture of my 1972 Piper Cherokee 180G?
It was parked next to Bob's RV-10 at the last meeting.