***-Wing Bolt Torque:***

-------- Original Message -------- From: Mitchell Sent: Tuesday, April 24, 2012 10:51 AM

To: canard-aviators@yahoogroups.com Subject: [c-a] LongEz Wing bolts

 Is there a torque value for the wing bolts on a LongEz?

-------- Original Message -------- Subject: Re: [c-a] LongEz Wing bolts

Date: Tue, 24 Apr 2012 11:22:28 -0600

From: Burrall L Sanders <craftsman@freeflightcomposites.com>

To: <canard-aviators@yahoogroups.com>, "Mitchell" <hiflier68@yahoo.com>

We tighten them to 45ft#

-------- Original Message -------- Subject: Re: [c-a] LongEz Wing bolts

Date: Tue, 24 Apr 2012 12:05:45 -0700

From: Marc J. Zeitlin <marc\_zeitlin@alum.mit.edu>

Reply-To: marc\_zeitlin@alum.mit.edu

To: canard <canard-aviators@yahoogroups.com>

...I assume that you mean "is there a specification for torque for the wing bolts" and the answer to that is "no". The wing bolts are in shear, and as long as they're snugged up "tight", they'll work just fine. I remember Burt saying that they'd work fine with finger tight nuts on the bolts (as long as they didn't fall off) because they were in shear (and I agree with that evaluation).

All that said, I tighten them as Burrall does - pretty much as tight as I can get them, for grandma.

Assuming that you're using locking nuts (as you should be), the actual torque value doesn't mean a whole hell of a lot anyway, but as long as they're "tight", they'll work fine and your wings won't fall off.
...Marc J. Zeitlin

-------- Original Message -------- Subject: Re: [Probable Spam] Re: [c-a] LongEz Wing bolts

Date: Tue, 24 Apr 2012 13:56:30 -0700

From: Keith Spreuer <keith@airstarts.com>

To: upperglass <upperglass@yahoo.com>, "marc\_zeitlin@alum.mit.edu" <marc\_zeitlin@alum.mit.edu>, canard <canard-aviators@yahoogroups.com>

... I painted last July I took them off and one bolt/bushing had significant (but certainly not dangerous) corrosion. I think they should come off once in a while but I don't really see the need every year.
Keith

-------- Original Message -------- Subject: Re: [Probable Spam] Re: [c-a] LongEz Wing bolts

Date: Tue, 24 Apr 2012 15:16:33 -0700

From: Keith Spreuer <keith@airstarts.com>

To: marc\_zeitlin@alum.mit.edu,canard <canard-aviators@yahoogroups.com>

Yeah the primary load is in shear but certainly due to sweep and pitch aero moments, maneuvering... the bolts see some tension. Drag loads will be in tension too. Guess that's why Grandma likes them torqued.
Keith

-------- Original Message -------- Subject: RE: [c-a] LongEz Wing bolts

Date: Tue, 24 Apr 2012 18:24:56 -0400

From: Ken <kenezmiller@optonline.net>

To: 'upperglass' <upperglass@yahoo.com>, marc\_zeitlin@alum.mit.edu, 'canard' <canard-aviators@yahoogroups.com>

I don’t advise removing the wings every year.  What I did was remove two bolts, one per wing each year.  I then would inspect them and the bushings for corrosion, schmearing them with heavy grease (on the grip only not the threads).  The upper pockets tend to get water in them and the bolts rust.  I hardly ever found a problem with the others.  Ken

-------- Original Message -------- Subject: [c-a] Long EZ wing bolt torque

Date: Tue, 24 Apr 2012 22:47:42 -0400 (EDT)

From: Q1terryMDT@aol.com

To: canard-aviators@yahoogroups.com

150-200 inch lbs. source page 50 Long EZ owners manual.

 Terry Crouch

-------- Original Message -------- Subject: Re: [c-a] Long EZ wing bolt torque

Date: Tue, 24 Apr 2012 20:31:08 -0700

From: Marc J. Zeitlin <marc\_zeitlin@alum.mit.edu>

Reply-To: marc\_zeitlin@alum.mit.edu

To: canard <canard-aviators@yahoogroups.com>

Terry Crouch wrote:
> 150-200 inch lbs. source page 50 Long EZ owners manual.

Terry is correct - both the LE and COZY POH DO state this. The COZY POH (don't have the LE POH in front of me) also states: "Since you cannot get a torque wrench in the access wells, it's acceptable to just estimate the torque. These bolts are not highly stressed in this application (contrary to normal wing attach bolts) and accurate torqueing is not required, just snug them up."

I'd assume that Nat just copied this from the LE POH.

From AC43.13-1B, page 7-9, the torque limit for 1/2" bolts is either 660 or 1100 in-lb, depending upon the nut used, and recommended torques for bolts loaded primarily in shear is either 290-410 in-lb or 480-690 in-lb, depending upon the nut used.

So I was incorrect that the LE POH doesn't specify a torque limit, but it is the case that the torque specified is WAY below the maximum for the bolt and even way below the recommended torques from AC43.13-1B. In other words, just make them tight :-).
Marc J. Zeitlin

-------- Original Message -------- Subject: [c-a] Re: LongEz Wing bolts

Date: Wed, 25 Apr 2012 05:57:41 -0600

From: Steve Stearns <steve@tomasara.com>

To: canard-aviators@yahoogroups.com <canard-aviators@yahoogroups.com>

Per CP52 page 5:
CAUTION - WING ATTACH BOLTS
We recently heard from a Cozy builder who had been chasing a minor but annoying vibration in his aircraft for some time. He finally traced it to the fact that his wing attach bolts were slightly loose allowing his wings to move a little in flight. After he tightened the three 1/2" bolts in each wing (the Cozy uses the Long-EZ wing and wing attach system) the vibration went away. He checked several Long-EZs in his area and found a couple of them with the same problem. We had not had anything like this reported to us before and we checked the two Long-EZs we have here at RAF, both were solid.

The way to check for this problem is to have someone put their hands on the joint between the centersection spar and the wing to feel for excess movement while you lift at the wing tip. A small amount of movement, less than 1/16" at the wing root leading edge, is normal. If excessive movement is detected, you must remove the wing bolt covers and torque the bolts. It is difficult to use a torque wrench in this area. We simply used two ratchet wrenches, each 6" long, and pulled about as hard as we could. It takes two people to do it right. Since a person can pull with about 75lbs of force with one hand, we can calculate the torque - 75x5=375in/lbs or 31ft/lbs. Using this method, we have never had one of these bolts work loose. A 1/2-20 aircraft bolt can handle 600in/lbs (50ft/lbs) of torque. However, with the glass plies in between the aluminum hard points, we would recommend no more than 400in/lbs (33ft/lbs) of torque on these bolts.

Steve Stearns N45FC O235 Long EZ

-------- Original Message -------- Subject: Re: [c-a] Long EZ wing bolt torque

Date: Wed, 25 Apr 2012 06:28:54 -0600

From: Burrall L Sanders <craftsman@freeflightcomposites.com>

To: <marc\_zeitlin@alum.mit.edu>, "canard" <canard-aviators@yahoogroups.com>

Page 52  in the Cozy MKIV POH says 150-200 inch pounds.  That is very low for such a large bolt with a locknut.    I recommend that the rolling torque be measured and the specified 150-200 be added, if you are going to use a torque wrench.   Burrall [www.freeflightcomposites.com](http://www.freeflightcomposites.com)

-------- Original Message -------- Subject: Re: [c-a] Long EZ wing bolt torque

Date: Wed, 25 Apr 2012 11:01:23 -0400 (EDT)

From: trcsmith <TRCSmith@aol.com>

To: canard-aviators@yahoogroups.com

Over torquing is not a good thing on our planes when composites are involved. You risk crushing the composite material on the aluminum plates to a point that they will dis-bond. If you think that the aluminum bushings will prevent that think again. Some bushings I found had to munch material removed, a few not enough. As Burt also said 1/4 bolts were planed and offered more than the required shear but a small 1/4 bolt didn't look very strong soooo in went an over kill bolt.

*(From AC43.13-1B, page 7-9, the torque limit for 1/2" bolts is either 660 or 1100 in-lb, depending upon the nut used, and recommended torques for bolts loaded primarily in shear is either 290-410 in-lb or 480-690 in-lb, depending upon the nut used.)*Use the aboverecommendations for your car or metal to metal compression but don't use it for composites. Unless it is stated for that use.What is tight or sung? Have an idea what you’re doing when you go tight or sung.  I use a torque wench almost every day where I work at United. I have an idea what the approximate torque may be and so do others reading this. If you work with a pencil for a living (as an example) and you bought your EZ just don't go out and give it all you got on you hardware. If your arm is quivering/shaking is way to munch.

I have no problems using a torque wrench on mine, granted a small movement is all you get but enough to apply the proper amount. If wings are removed for any reason in our no cal group I like to look at the hardware at that time and note it in the log book.
Tom Smith  A&P Long-EZ N12TS