



## AUCKLAND REGIONAL MICROLIGHT AIRCRAFT CLUB

[www.armac.info](http://www.armac.info)

OCTOBER 2006

**CLUB NIGHT:** 1930 hours Wednesday 11<sup>th</sup> October 2006

Preceded by Committee meeting 1830 hours  
Visitors are most welcome - refreshments available

**VENUE:** Newmarket Club, 13 Teed Street

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**PREZ SEZ:**

*The grass strip at Mercer should be all go this weekend, as long as it has had time to dry off from the rain earlier in the week. The all weather strip has definitely allowed for more flying than we would have achieved at Pikes that's for sure.*

*Andrew now has a type rating on his new Titan Tornado so it will be a while before the smile is wiped from his face.*

*Unfortunately the club Bantam has a blown radiator and will be out of service until it's repaired, hopefully by next weekend, eh Chris.*

*We still have a few students on the books so the club looks OK for the time being. We will crank up the BBQ on a regular basis this summer starting with Labour weekend, I believe Peter put his hand up to take charge of that job. This will hopefully be at the end of a club day out flying.*

*You will or should be aware that we are definitely going to entertain the Scouts this weekend, it has been put off 4 times now, but the God of weather looks to be granting us a nice weekend. If you can help in any way please turn up.*

*As we have been running an FRTO course over the last month and the last evening was going to be a swat of the exams, it may be prudent to do it at the club night so we can all brush up on our radio work. See you all this coming Wednesday.*

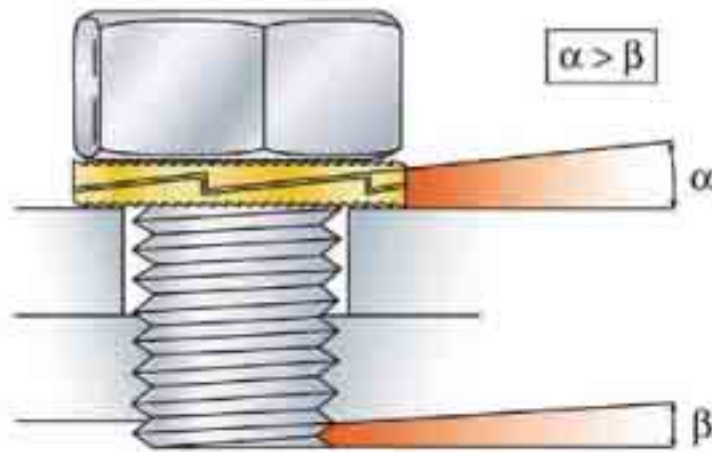
Anton

## Nut and Bolt locking devices Anton Lawrence

*While doing research into bolt types I came across several new types of locking systems and found some interesting facts regarding Loctite®.*

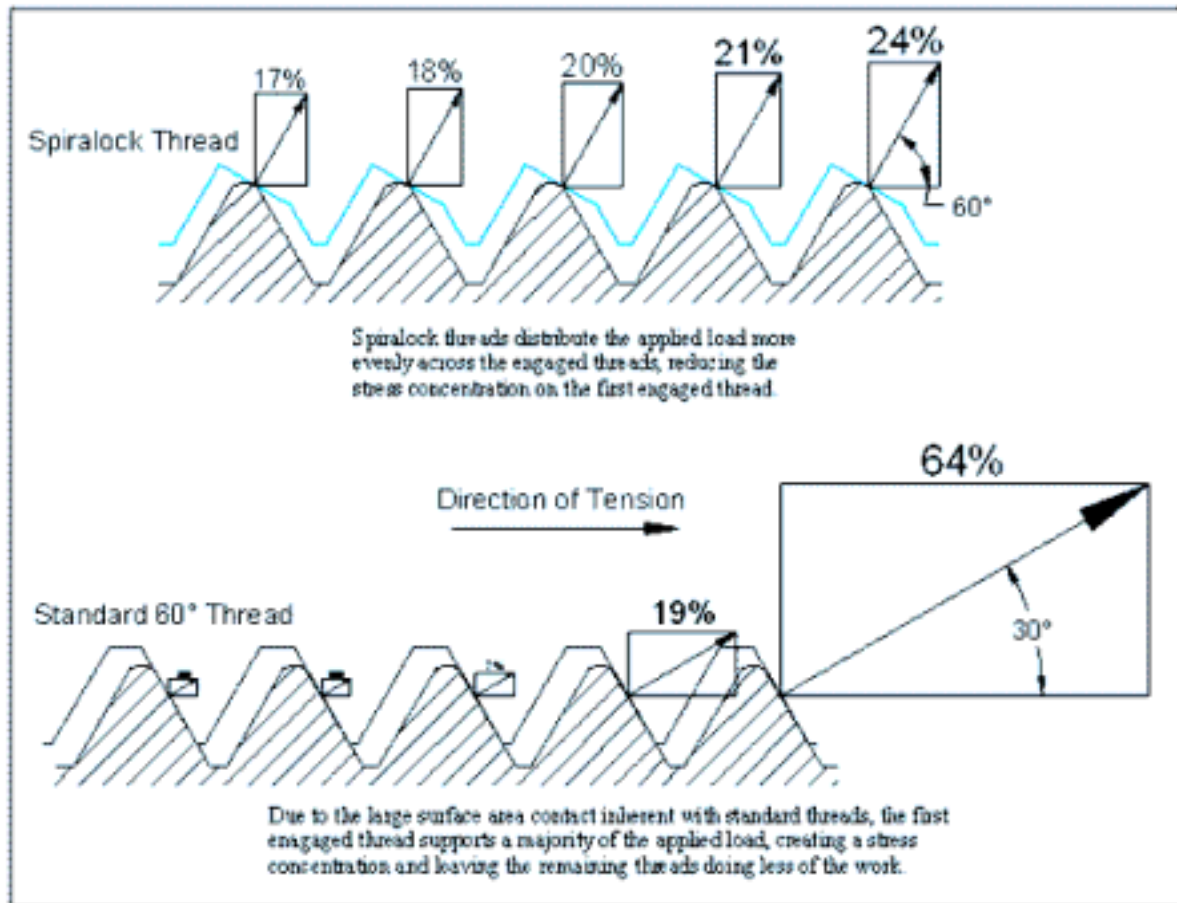
*Nut or bolt back off is one reason why bolt preload can be lost, if the bolt is subject to cyclic loads it will break, the type of bolt will only have a bearing on how long it takes to fail.*

*The common types of nut locking devices are spring washer, nylock nut, lock wire, tabs and locktite®. Under severe vibration all these will fail to some degree. A new type of washer was shown to me by Steelmasters, these are called Nord-Lock® Washers. They have in fact been around for about twenty years but are not well know of. Each washer is in fact two identical washers, one face has many small radial ridges which grip the material being bolted or the underside of the nut or bolt head, the hardness of the washers is more than a 12.9 bolt so no problems there. The other face has small wedges or cams which have an angle slightly greater than the helix angle of the thread of a nut or bolt. When the washers are placed face to face and the nut or bolt tightened, the ridges grip the work, when it comes time to undo, the ridges prevent the washer from turning, the only way out is for the wedged cams to slide up on each other. This sliding causes the bolt to lengthen and so increasing the preload on the bolt, this can not happen without the use of a wrench. The simplicity of use and effectiveness can't be underestimated. For more information and a demo video check out [www.nord-lock.com](http://www.nord-lock.com) Nord-Lock® also have extensive torque tables and a torque calculation spreadsheet.*



**Nord Lock Washer.**

*Spiralock® is another method of improving the friction of nut or bolt. It is a different type of female thread form which better distributes the axial force across more threads than a standard thread. As the forces are spread over a greater number of threads the chance of thread stripping is also reduced. The torque required to tighten a Spiralock® thread is 10% to 15% higher than normal but test should be done if you are considering using these. Spiralock® supply specialized taps to cut the threads and nuts with the specialized thread pre-cut. For more information go to [www.spiralock.com](http://www.spiralock.com)*



### **Spirallock® Thread Form**

*Loctite® 620 is the thread adhesive specified by Jabiru for the flywheel retaining bolts and several other bolts on their engines. As 620 is not primarily used as a thread lock adhesive I contacted Loctite® directly in order to get more information, the online data sheets do not give friction coefficients. I was told that 620 could be used as a thread locking product; it has the advantage of slower cure about one hour, and higher temperature resistance. I was given some K factors which relate to the friction coefficient of lightly machine oiled steel bolts, in other words Loctite® does not affect the torque of a standard bolt. This would also relate to a friction coefficient of 0.15 and I have used this figure in the torque calculations for the Jabiru bolts. The following is straight from the 620 data sheet.*

*“Loctite® 620 is designed for the bonding of cylindrical fitting parts. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. Typical applications include locating pins in radiator assemblies, sleeves into pump housings and bearings in auto transmissions. Particularly suitable for applications where temperature resistance up to 200°C is required.”*

For more information go to <http://www.loctite.co.nz>

*It has also been suggested that 620 would if lightly applied to the mating faces on the Jabiru flywheel, help prevent the fretting. Certainly the extract above would indicate this as a possible application, but I have yet to talk to anyone who has done this or found any other empirical evidence of it having been used in this way, I would be very interested to hear from anyone who has more information on this type of use.*

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## **UPCOMING EVENTS**

### ***Raglan Airfield - Black Sands Fly In 2006***

*4th and 5th November 2006*

*Informal fly in and social gathering hosted by the Waikato Thames Valley chapter of the NZ Sport Aircraft Association - everyone welcome. Accommodation and HQ at Raglan Kopua Holiday Park (beside airfield. Some flying activities planned for both days - details to be confirmed but may include an Air Rally and a beach landing practical workshop. Lots of activities for families nearby - beaches, cafes, craft shops, playgrounds - Icecream! Further details to follow.*

*REF: RAANZ Website*

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*FRTO & Air Navigation Sample dialogue:*

*Lost Microlight Pilot: "Big airport with a little Bantam overhead, please identify yourself!"*

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*At dawn the telephone rings:*

*"Hello, Senōr Rod? This is Ernesto; the caretaker at your country house."*

*"Ah yes, Ernesto. What can I do for you? Is there a problem?"*

*"Um, I am just calling to advise you, Senōr Rod, that your parrot died."*

*"My parrot? Dead? The one that won the International competition?"*

*"Si, Senōr, that's the one."*

*"Damn! That's a pity! I spent a small fortune on that bird. What did he die from?"*

*"From eating rotten meat, Senōr Rod"*

*"Rotten meat? Who the hell fed him rotten meat?"*

*"Nobody, Senōr. He ate the meat of the dead horse."*

*"Dead horse? What dead horse?"*

*"The thoroughbred, Senōr Rod."*

*"My prize thoroughbred is dead?"*

*"Si Senōr Rod, he died from all that work pulling the water cart."*

*"Are you insane? What water cart?"*

*"The one we used to put out the fire, Senōr "*

*"Good Lord! What fire are you talking about, man?"*

*"The one at your house, Senōr! A candle fell and the curtains caught on fire."*

*"What the hell??...Are you saying that my mansion is destroyed because of a candle??!!!"*

*"Si Senōr Rod."*

*"But there's electricity at the house!!! What was the candle for?"*

*"For the funeral, Senōr Rod."*

*"WHAT BLOODY FUNERAL?!"*

*"Your wife's, Senōr Rod...She showed up one night out of the blue and I thought she was a thief, so I hit her with your new Tiger Woods Nike Driver."*

*.....SILENCE.....*

*.....LOOOONG SILENCE.....*

*"Ernesto if you broke that driver, you're in deep shit!"*