

A RUBBER STRETCHING INVESTIGATION

by Earl Griffith

This July, while in Muncie practicing for the NATS, a friend noticed that I wasn't stretching my rubber motors as much as is often recommended. He commented that I was giving away turns and torque. Really, I thought to my self, I had better look into this. Stretching rubber motors to seven times its relaxed state is an amount that I have seen recommended many times although I cannot site a source. Also, although I have heard this recommendation and seen it practiced by other modelers, I have never seen any quantitative data on the practice. So, I set up the following test. I made up ten motors of six strands of 1/8" rubber, each six inches in length. The motors were washed and lubed and, of course, came from the same batch of FAI rubber. Five of these motors were stretched 2 times the relaxed length and immediately wound with turns to about one half of maximum torque, then I would start moving in until the motor broke. Torque values were recorded by my research assistant, Jane. The second set of five motors were stretched 7 times the relaxed length and wound the same as the previous set. These are the results of those tests:

Rubber Stretched 2X

Motor	#Turns	Torque
#1	316	12
#2	332	12
#3	336	14
#4	320	11
#5	340	14
Average	328.8	12.6

Via the Nov,
2013 issue of
WHAM,
newsletter of
the Wichita
Historical
Aircraft
Modelers.

Rubber Stretched 7x

Motor	#Turns	Torque
#1	368	17.5
#2	352	16
#3	356	19.5
#4	360	16
#5	364	20
Average	360	17.8

Well, wouldn't you know it, my friend was right on both accounts. The results showed that # turns increased by about 9.5% and that torque went up about 41 %. Jeepers! Although these tests are limited to only five motors in each test group, a rather small number, there is no overlap between the two. The highest torque in the 2X group (14) is less than the lowest torque (16) in the 7X group. This is also true of the number of turns to motor breakage, 328.8 vs. 360.