The Value and Use of Torquemeters

Editors note: The following information; which proves invaluable to rubber fliers, was shared on Free-Flight Digest and permission was given to share it with anyone who could use it. Hope it is as useful to you as it was for me.

by Tony Becker

What is a torque meter and how is it used to help indoor model builders? A torque meter is a device used to measure torque(power) in a rubber motor at any number of turns. It assists the modeler in improving duration and/or altitude of any endurance or scale model.

One of the new techniques I discovered after over 30 years of Inactivity, was the need to purchase a torque meter and how to effectively use it. After having the privilege of flying indoor models In the dirigible hangers at Lakehurst, New Jersey, and winding rubber motors to capacity, winding motors today has now become more complex. With most ceiling heights of available flying sites between 20 to 60 feet high, you must control your model from climbing too fast and too high.

A torque meter is a winding stooge with a hook attached to a short piece of .012 to .016 music wire with a numbered gauge and a needle attached to a winding hook. The small diameter wire is for rubber motor sizes up to .055 and the heavier wire is for big endurance and scale models.

As you put winds into your rubber motor, you can read the torque developing. With the unusual and varying types of rubber that we buy today, a torque meter is a must. I have found variances in the rubber I am able to buy and a torque meter can show a difference of over 20% for 2000 turns. This is rubber from the same 50 foot length!

The use of the torque meter is simple. As an example, let's take a loop of .045 x .038 x 16-inch rubber motor for an EZB model. Assuming your model is adjusted, put 1000 turns in your motor and carefully observe the torque meter reading. Record the data such as the rubber size, the torque meter reading, and

the turns on your flight chart (see chart which follows). Fly the model and record the time. Let's say your model climbed half-way to the ceiling (or your desired safe altitude) and landed with a time of 5 minutes. The rubber had 500 turns left. Your torque meter reading for 1000 turns was 2.5. Try another flight of 1200 turns and a torque meter reading of 3.0. If the time did not increase by at least 2 minutes, and your climb was slightly higher than the first flight, record the data on your flight chart and determine what to do next. I would suggest to either increase the size of your motor or reduce the length of your original motor. (You could also change props to one of the same diameter, but with a lower pitch). Here is where your torque meter is worth its' cost. When you wind again, put in 1000 turns. You will notice the torque meter will be over the 2.5 that you recorded on the first flight if you changed only the rubber. You should unwind until the torque meter reads 2.5. This will enable the model to again climb to the same height, but the model will fly longer and land with fewer turns. Again record all this data on your flight chart and then analyze your results. After a few flights, you can determine the amount of turns, the torque meter reading you need for best results, and also develop a good concept regarding the potential of your model in any existing condition.

It is important to remember two facts; 1–Whenever You change the prop diameter and/or pitch, you must start over with your testing and 2–As you buy or cut rubber you will find variances in turns and torque meter readings with each motor of the same size. It is also important to remember that you must give your motor a chance to rest after each flight. I like to wash my motor in clear room temperature water after each flight and immediately air dry it before I re-lube it and fly.

There are a few torque meters on the market today. I have two from Jim Jones; one for motors up to .055 and the other for motors over .055. You may also buy winders with a torque meter attachment.

Good luck and better flying.

(Ed Note: Tony provided the Flight Log (14.6k gif) which follows on the next page)

The following schematic is for those of you who are mechanically inclined enough to want to build your own torque meter.

