The Myth of High RPM

by Larry Schlasinger

The first time I pushed the throttle forward on my newly acquired Cessna 185 I noticed something strange. Instead of the tach going to the expected 2850 RPM it went all the way to 3100… wow.

Since I had no experience with 185's or their engines I decided to seek the advice of a friend that had been flying them for years. He asked where it had come from, and when I answered Alaska, he started to laugh and said "figures". I inquired as to what was so funny and he stated "those guys up there will do anything to increase the performance, whether it's approved or not". The increase in RPM will increase the horsepower and reduce your takeoff… just don't let an inspector see that as it should only go to 2850. His explanation seemed to make good sense and I started to make takeoffs with the RPM at 2850 unless I thought I needed the extra performance. Anytime I was heavy or it was hot the prop control went in to the panel and the prop screamed and away I went. It did seem to have better power… and a lot more noise. I flew this way for many years and I never thought much about the RPM… just high for more power and less when I didn't need it.

Then I was introduced to Gerd Muhlbauer, the President and Chief Engineer of MT Propeller. I was negotiating to be his U.S. Sales Rep when the subject of high RPM and specifically the Cessna 185 came up. I wanted to STC the MT 3 blade propeller for the 185 and I wanted a long prop that could be turned at least 2850 RPM. Gerd started to laugh (sound familiar?) and told me a story about Horsepower vs RPM vs Thrust. He gave me a good lecture about what makes a plane fly and how power is converted to thrust and it is thrust that really counts. He stated that my idea of more RPM making more power was correct, but when the prop is turned beyond about .9 mach (the speed of sound) it starts to become inefficient. When this happens, the propeller is converting power to noise instead of thrust and real performance decreases. I found this hard to believe (why should I believe one of the best propeller engineers in the world?) as I had been flying with the RPM turned up for so long. Gerd saw the doubt in my face so he decided to prove to me his point.

He set up a digital thrust testing scale and attached it to the stinger on my 185. We then proceeded to measure the static THRUST applied at full power and RPM starting at 2400. To my chagrin, he was right. We saw an increase in thrust up to about 2600 and then it started to DECLINE after that. We could only get 2800 static, but the thrust was considerably less than the 2600 reading. I can just imagine what 3000 would have been… much less.

After this testing session, I invited some of my other seaplane friends to come to a propeller comparison/testing clinic. We assembled several propellers suitable for the 185 including: a standard metal 86" 2 blade, a new 86" metal 3 blade, a 82" MT 3 blade composite and also an 82" MT 2 blade. We ran all the props on the same plane, on the same day, in the same conditions. Everyone there (except me) was really surprised by the results. ALL the propellers

produced more THRUST at lower RPM's (all around the 2600 mark) and the 83" MT 2 blade produced the most. The 78" MT & McCaulley 3 blades were about the same and the 82" 2 blade McCaulley was the least. The MT 2 blade was also almost 40 pounds lighter than the metal 3 blade… that combined with titanium gear will reduce the weight of your plane almost 100 pounds.

So what does all this mean? It means that I've flown under a misconception for all these years and made my neighbors mad at the same time. The only advantage of the high RPM scenario is a really great buzz job at camp, but to sacrifice takeoff thrust and engine life for this isn't real smart. I find it better to fly a little lower on my camp buzz jobs and keep the RPM where it does the most good. It also means that when someone with as much expertise and experience as Gerd Muhlbauer tells me something, I'll be more inclined to believe him.

Larry Schlasinger is the Founding Partner of Flight Resource. Today they are the world's largest volume distributor of MT Composite propellers and own several STC's to install the MT props on thousands of aircraft. Larry is an award winning airshow pilot with A.C.E. credentials, an A&P with IA and thousands of hours flying singles and twins on wheels, floats and skis all around the world. MT-Propeller - Germany contracted with Larry, through Flight Resource, as a North American Distributor. STC's to replace stock metal propellers were developed and approved for hundreds of popular models of Cessna, Piper, Beech, Mooney, Aviat and many others.