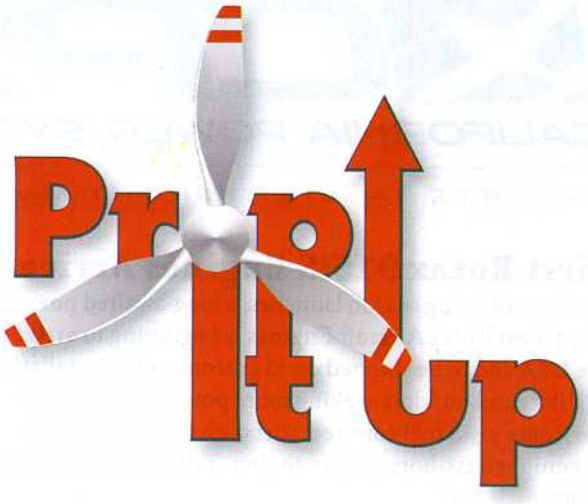
A New Prop For My Trike



Kevin Szalapski talks about his research into a new propeller for his trike.

I recently bought a new prop for my trike. My existing one works just fine; however, in the 14 years since it was installed on the trike there have been many advancements in newer, lighter props that deliver more performance. I was made aware of E props by Larry Mednick from Evolution trikes. He had always installed Sensenich props on his Revo Trikes. There are no issues with these 2-bladed aircraft props and they work just fine, but the two blades are big, thick, and heavy compared to the E props. Larry contacted several prop manufacturers to see if he could find a better choice than the Sensenich. Several companies sent him their models designed to bolt onto the Rotax 912 drive shaft. They work well on both the 80 HP and 100 HP Rotax engines. He installed several of these props on his Revo trike to see how they all performed. He really liked everything about the Excalibur prop by Helices, which is made in France, and they stood out beyond all the others.

Details about the Prop

This model comes in 3-, 4-, and 6-blade versions in a pusher configuration for many Light Sport Aircraft. They also have a Durandal model for tractor configuration. One big advantage I liked about these props is that they come factory balanced, so I do not have to pay a prop balancer guy to balance the prop after installation. The hub is color coded so both halves will go together the correct way. I bought the 4-bladed version, and every blade and slot is also color coded, so the prop goes together exactly the way it was balanced at the factory. Setting the pitch of the blades is very critical to getting a smooth-running engine. I was always intimidated by this setup process, and I knew it had to be very precise. Larry made an instructional video that was very helpful for installation and pitching of the prop. One nice addition to the prop kit is that the Helices company sends you a digital protractor with every prop that is mounted on a bracket, and it has a lip

A six-blade version of the Excalibur prop on a gyroplane.

BY KEVIN SZALAPSKI

Left: Four blades on half of a prop hub, notice the color coding between the blades and the positions on the hubs.

Above: Carbon Fiber Hub.

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that rests over the prop blade for the pitch adjustment. This protractor also has a level at the top so that you can make sure the blade is level while you set the pitch angle. You measure 15.75 inches out from the blade base and mark it, so that your protractor is in the same position when adjusting the pitch for all four blades. The bolts use Nordlock washers, so no safety wire is needed after torque is set, and the washers can also be reused.

Performance and Reduced Load on the Engine

The blades and the prop hub are both made of carbon fiber. On the Excalibur model, the 70-inch-long blades are very thin and lightweight. When starting a 912 with most props, the gearbox chatters loudly until the prop RPM catches up with the engine. The startup with the Excalibur prop is very easy on the gearbox, as the engine sees very little of a load from the prop. The unique dihedral hub design angles the blades forward and uses centrifugal force to counter the effects of blade flex under load. The tolerance for the pitch setting is .3 degrees plus or minus from the desired pitch angle. The closer that you can pitch the angle on every blade will make the running smoother, which is great for the engine gearbox and aircraft performance. I should see an increase in my rate of climb and a shorter takeoff distance, which adds to safety on departure.

Cost and Delivery

The cost of a 4-bladed prop and spinner was $2250 including shipping, and was shipped from France directly to my house. It came very well-packaged and arrived with no damage to the contents. Many Revo pilots and some Airborne owners also have swapped out their older Sensenich props for the Excalbur props and are really enjoying the way they fly. They are used in many of the Rotax engine 912 versions as well as on trikes, gyrocopters, airplanes, and paramotors.

For more information and the link to Larry's interview and installation videos can be found at:

http://evolutiontrikes.com/e-props/

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