

Comparison of 2 blade and 3 blade props

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The aircraft weight was 1,400 pounds, all temperatures are in degrees Centigrade, airspeeds are in knots, and all tests were run within a three hour time period.

The maximum RPM differential between static and full throttle was 382 RPM for the 3 blade vs. 460 RPM for the 2 blade.

The two props allowed a similar static RPM. the 2 blade turned 2330 RPM @ 100 degrees OAT while the 3 blade

turned 2340 @ 96 degrees OAT.

The 2 blade prop was sized for my O-320 engine while the 3 blade was intended for a 175 to 180 hp O-320.

Because it was so hot the all out speeds are disappointing, but I expected that, and at least it affected the props equally. After looking at my other charts for my Great American prop I found normal temperatures produced about 12 knots more. I assume it would affect the 3 blade the same.

To determine relative efficiency between the props I ran comparisons at 7 gph and at 7.5 gph. Both tests were leaned the same amount

Surprisingly, with the noise canceling headsets on there is no difference in

the perceived noise level of the two props. There is a lower vibration level with the 3 blade. It felt almost like a 6 cylinder engine. The 3 blade had a more "whinny or whistling noise" and seemed to run smoother. On long trips this may be a very desirable feature.

My conclusion is the Performance 3 blade is not worth \$1600+ for 2 knots more efficiency and a lower vibration level. I think the Performance 3 blade would have done better if it was sized for my engine. On the other hand, I think the 3 blade had a better blade design than the 2 blade and that had a lot to do with efficiency.

In the following chart **bold numerals indicate a 2 blade prop** while the normal characters indicate the 3 blade prop.

Density altitude	4,800	5,100	4,800	5,100	9,800	9,900	9,800	9,900
Indicated altitude	3,000	3,000	3,000	3,000	8,000	8,000	8,000	8,000
IAS (Kts)	170	170	148	145	152	157	141	140
TAS (Kts)	182	183	159	157	175	181	163	162
OAT (degrees C)	29	30	29	30	17	18	17	19
fuel flow (gph)	11.4	12.5	7.5	7.5	9.9	10.4	7.0	7.0
RPM	2732	2840	2476	2540	2675	2790	2500	2560

3 Blade Catto Prop Update

David Dent (CA) - I have been flying Craig Catto's three bladed props for over 400 hours in four years. I think they are great! Made of wood and glass, they are exceptionally quiet and smooth.

The one I am flying now uses an airfoil from the AR-5 aircraft. I am seeing 230 mph with it. Craig is building up a 3 blade ground adjustable prop for my

aircraft and is running one now on a 180 hp RV-6. The prop has all molded blades using the airfoil from the NASA designed V-22 tilt rotor aircraft.

I feel the Catto props are beautiful. Craig has well over 1,000 blades out there. For homebuilts, I believe he puts out the best for the price. My three blade prop cost \$900. It takes him over 30 hours to make a 3 blade prop and I've never heard of anyone disappointed in his prop.

Cozy Sump Tank

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