How To Convert the Size of a Two-Blade Prop to a Three-Blade or Four-Blade Equivalent
By Paul Geders

Normally, you go down 1 inch in diameter and keep the same pitch. For example: you have a 2-blade, 10 X 6 prop, and you would go to a 9 X 6, 3-blade to achieve almost the same performance.

There is a very complicated formula for determining the load factor of a propeller. In it's most simplistic form, for a 2-bladed prop, the load that a prop places on a motor is equal to the diameter cubed, times the pitch, or D x D x D x P. For a 2 bladed 10x6 prop, the load factor would be 10 x 10 x 10 x 6 or 6,000. For a 12x8 prop it would be 12 x 12 x 12 x 8 or 13,824.

The more complete formula, which takes the number of prop blades into account is D x D x D x P x Square root (N-1), where N = the number of prop blades. For a 2 bladed prop, the square root of 2-1 is the square root of 1 which is 1, so the term just drops out of the equation. For a 3-bladed prop, the correction factor is the square root of 3-1 or the square root of 2, which is 1.414.
For a 4 bladed prop, the correction factor is the square root of 3, which is equal to 1.732
So if you have a 3-bladed 9x7 prop, then the load factor is 9 x 9 x 9 x 7 x 1.414, which is 7,216, and this would be roughly equivalent to a 2-bladed 10x7 prop, which has a load factor of 7,000.
If you had a 4-bladed 12x7 prop, then the load factor would be 12 x 12 x 12 x 7 x 1.732 or 20,950
This would be roughly equivalent to a 2-bladed 14x8 prop, which has a load factor of 21,952.

In the end, if the load factor of 2 props is the same, you will get similar RPMs from the two props, and similar performance.