

3 BLADE Prop BALANCING

Overview:

It doesn't matter what your prop is made of, Wood, Glass filled Nylon, Plastic, or Carbon Fiber, the balancing technique is the same. Balancing a 3 blade propeller isn't difficult if you go about it properly. It does take a lot longer to balance as compared to a 2 blade, since you have an additional element to contend with. In essence you ARE balancing 2 blades at a time, and repeating it until all 3 blades are equal in weight. So it is **necessary** to locate and identify the lightest and heaviest blades.

You will need:

1. good quality prop balancer
2. SHARP Exacto knife or similar
- 3, 150 grit and 400 grit sand paper
4. A Sharpie or Magic Marker felt tip pen

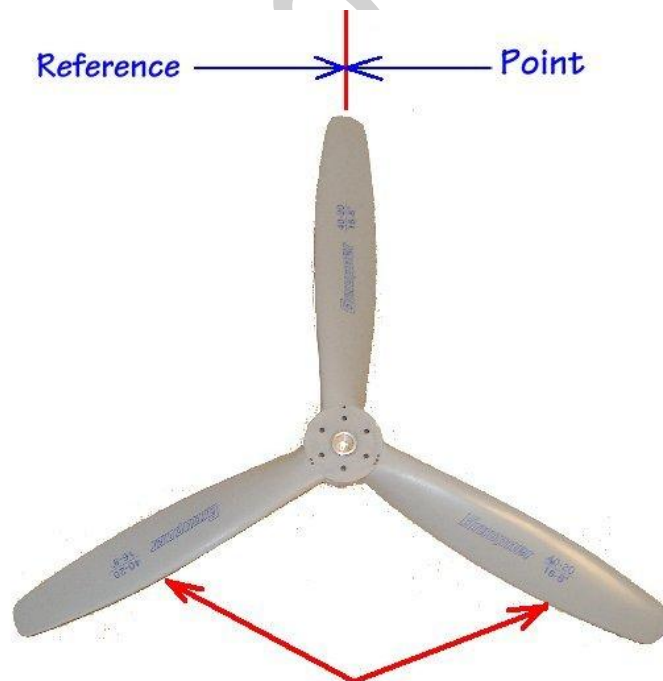
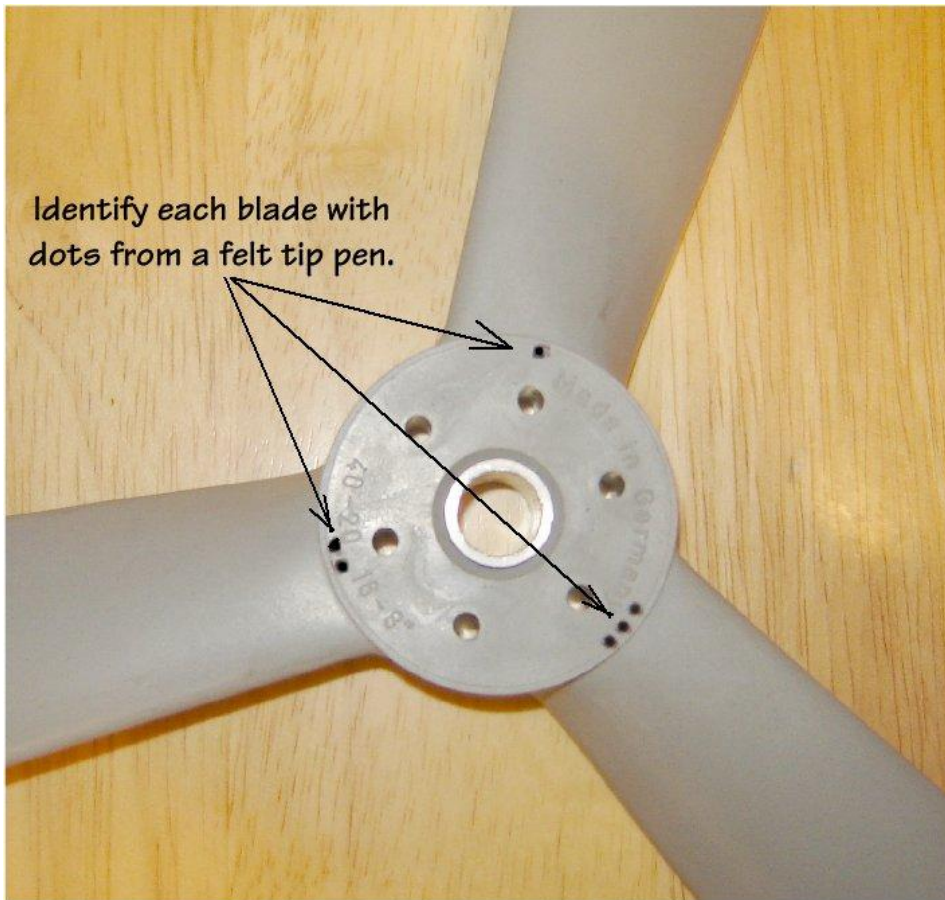
Let's begin:

PREPARE and IDENTIFY the prop:

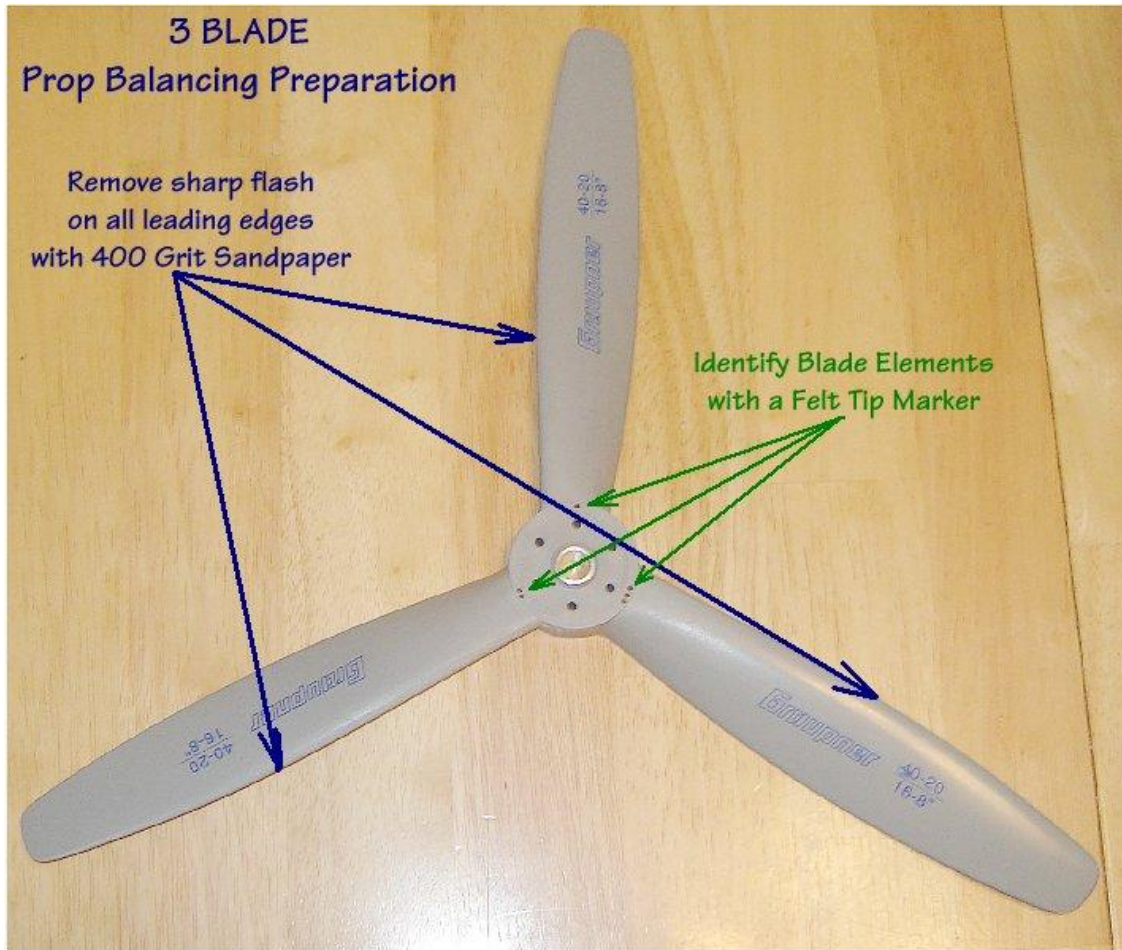
Using 400 grit sand paper gently sand and remove the flash from the **leading edge** (only) of each blade element. DO NOT sand the trailing edge. When this is done, thoroughly clean the prop. **Place the prop on your balancer and let it settle in.** The blade closest to 12:00 is to be marked with **1 DOT**, on the hub. Now mark the second closest to 12:00 with **2 DOTS**, and the heaviest blade with **3 DOTS**. SEE: photo below. **It is very important to mark the blades correctly.**

Begin the balance process.

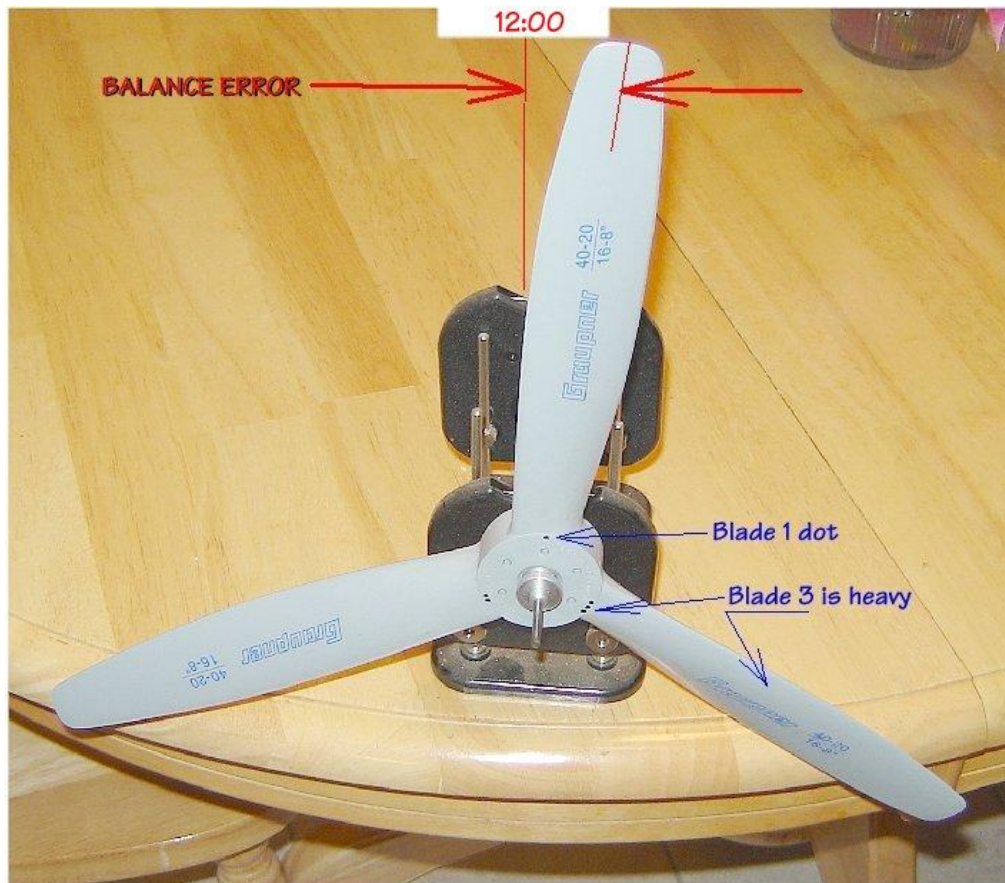
ROTATE the blade with **2 DOTS** to the **12:00 position**. Scrape, and or sand the heavy blade 3 DOTS until your "reference" blade (**with 2 DOTS**) stays at rest at 12:00. When this is done, **ROTATE** blade 3 (**with 3 DOTS**) to 12:00 and repeat the balance process. When its done, **ROTATE** blade 1 (**with 1 DOT**) to 12:00 and repeat the balance one last time.



Balance as though it is a 2 blade prop using the top blade as your reference
When you reach balance, rotate the next blade to the reference point then continue the
balancing procedure again. Keep doing this until all 3 blades have been referenced at the top.



These dots are your reference markers during your balancing procedure **1 DOT is your lightest, 3 DOTS is your heaviest, and 2 DOTS is in between..** The object is to get the "reference" blade to rest at dead-center or 12:00. You will scrape, and or sand the leading edge of the heavy blade until the "reference" blade rests at 12:00. When this is done, you will rotate the next blade to the 12:00 position and repeat the balancing process. **You will do this until all 3 blades have been referenced at 12:00.**



A well balanced prop will stop in random positions every time its rotated, with little or no backup.

You may wonder when to stop balancing... If the "reference" blade is within 1/2 its width (or less), you are good to go for Higher RPM engines. If your engine turns less than 8000 RPM a full blade width is acceptable but its not perfectly balanced.

NOTE: Balancing a 3 blade prop can be frustrating and time consuming. The prop in the photo took me a good hour to balance but its smooth as glass on the engine. It's running up to 9000 RPM and not a speck of prop vibration.

How to determine if your prop IS or IS NOT in balance

Propeller vibration is directly proportional (in amplitude) to engine RPM (frequency). *In other words*, the faster the engine runs the worse the vibration gets.

A well balanced prop:

As your engine RPM (frequency) goes UP, your overall aircraft vibration (amplitude) will go down and you'll barely feel it at the wing tips and rudder.

A non-balanced prop:

As your engine RPM (frequency) goes up, the overall aircraft vibration (amplitude) gets much more intense and you'll feel it throughout the airplane.