



High-Performance Metal Props

How to sharpen and balance your GrimRacer High-Performance Metal Propeller



Why balance and sharpen your propeller?

Model boat propellers typically spin at the same RPM as the motor or engine. Any vibration that comes from the propeller can rob your boat of both power and speed. It can also ruin electronics and even break metal parts. It is always best to balance your propellers. Likewise a dull propeller can upset the handling of the boat.

WARNING: Copper-beryllium can be dangerous to inhale. Please wear a dust mask when you are filing or sanding on your metal propeller.

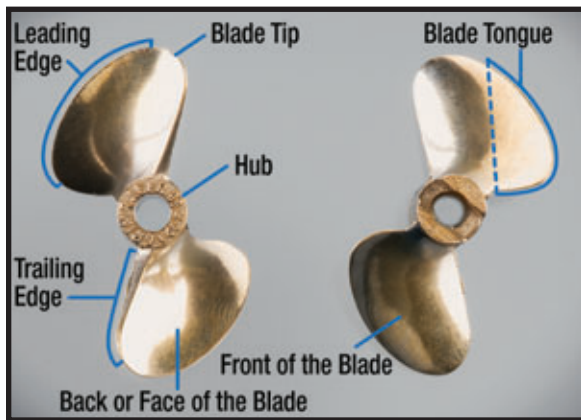
Tools and supplies you are going to need:

- Dust Mask
- Eye Protection
- Prop Balancer (#TOPQ5700)
- Small Round File
- Small Flat File
- 220 wet/dry sand paper
- Scratch Pad (red)
- Felt Tip Pen

Optional supplies for the final step:

- Moto Tool and sanding pads
- Polishing supplies

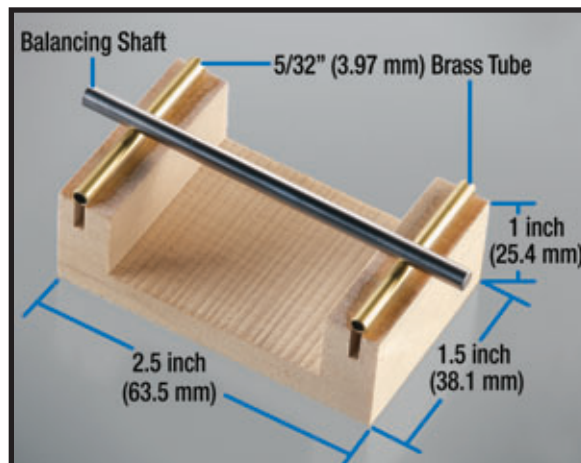
Prop Identification:



Review your prop first by checking that it fits properly on your stub shaft. On occasion your prop can have a small piece of flash in and or around the bore that can keep the prop from sliding onto the prop shaft. Use a small round file to remove any excess casting.

Check the fit of the propeller to the drive dog. It is not critical that it fits tight onto the drive dog, but rather that the two index together correctly to keep the prop from slipping on the prop shaft. You can file this slot open a bit if you need to.

Shaft balancer:



If you do not have a boat propeller balancer, you can make your own prop balancer. Follow these steps;

Cut a 1" (25.4 mm) tall block of hardwood to 1 1/2" (38.1 mm) wide by 2 1/2" (63.5 mm) long. Using a table saw with the blade set to cut 1/4" (6.35 mm) deep, cut two slots on each end of the block 1/4" (6.35 mm) from the ends. Next set the blade to cut 3/4" (19.1 mm) deep and carefully set the fence to cut out the center of the block. You need to do this so that your prop has room to rotate from side to side. If you are balancing larger diameter props, you might want to start with a taller block of wood. Cut two lengths of 5/32" (3.97 mm) brass tube to 1 1/2" (38.1 mm) long. Glue the brass tube to the center of the slots rests. You are also going to need to get yourself some 3" (76.2 mm) long lengths of drill rod to fit the bore on the hub of your props. Typically you will need a 1/8" (3.18 mm) shaft, a 3/16" (4.76 mm) shaft and a 1/4" (6.35 mm) shaft.

Magnetic balancer:



Top Flite #TOPQ5700

You do not have to spend any time leveling a magnetic balancer but you will want to make sure you have the ends of the balancing shaft polished to a mirror finish as well as the magnets.

Let's get started.

Step 1: Level the balancer and prepare the prop

Start by leveling your balancer. You can use the shaft of the balancer to level the base by taking note which direction the shaft wants to roll to. Adjust the balancer so that the shaft does not roll to any one end. Also, now is also a good time to use a file to carefully remove any casting marks and flash off the hub of the propeller.

Step 2: Balance the prop



Place the prop installed on your balancing shaft onto your prop balancer. The heavy side will be the area of the prop that rotates below the center of the balancing shaft.



NOTE: It is possible that you will not have a single heavy blade but rather an entire side of the prop that rests below the center of the balancing shaft. In other words your prop will sit on the balancer with the blades resting horizontally but still be out of balance.



Grimracer Says: Think of your prop as being a round disk. Any area of the prop that sits below the center of balancing shaft, and returns to this spot, is the heavy side of the prop, regardless of the position of the tips of the blades. When you have your prop balanced perfectly it will not repeatedly return to the same position.

Place a mark on the heavy side of the prop. Remember, this might mean you have to mark the tongue of one blade and the tip of the other. I like to cover the heavy side of the prop with marker. The marker helps identify exactly where we need to remove material as the file removes the marker.



IMPORTANT:

It is best to file only on the front of the blades which is the side of the prop that is notched to fit the drive dog. You might have to do some clean up on the face but all the balancing should be done on the front of the blades, never on the face. Only remove small amounts of material at a time. Check the balance often and file as needed. When the propeller no longer finds a heavy side on the prop balancer, your prop is ready to sharpen.

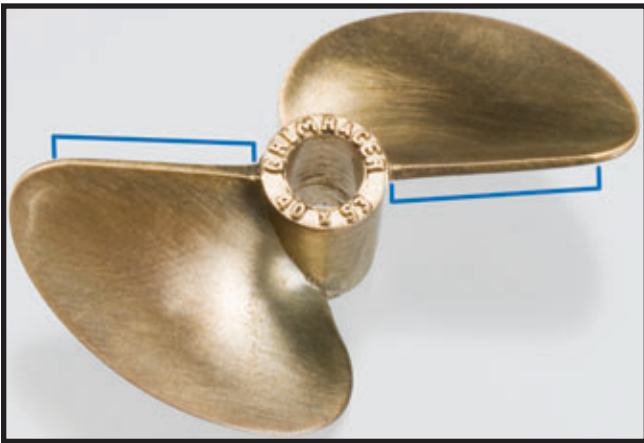
Step 3: Sharpening the prop



Use the file and work your way from the tongue to the trailing edge. Care has to be taken not to roll over the leading edge of the prop as you sharpen. Work slowly and take your time.



When you have a good, sharp leading edge, fold over a piece of 220 grit sandpaper and work the leading edge to a razor sharp edge.



It is important that you DO NOT sharpen the trailing edge of the prop. Instead, use a file to square it off as shown in the picture.

Step 4: Finishing the prop



Finished Propeller.

We recommend a satin finish on the prop. A super shiny prop can cavitate more than a brushed satin finish. A satin finish can also help your boat accelerate out of a turn faster.

Using a scratch pad, buff the entire prop down until all the shine is off the blades. Be careful as you are now working with a very sharp propeller.

Your GrimRacer High-Performance Metal Propeller is now ready for use!