Windsor Propeller Company, Inc.

Master Airscrew

DRILL GUIDE BALANCE SYSTEM INSTRUCTIONS

(Part Numbers MA60420 and MA60421)

Read these instructions completely before using this product.

Now perfect spanwise and chordwise balance is possible with no more scraping or sanding. Most of us are familiar with balancing a propeller spanwise (tip to tip) using a balance stand. Now, chordwise balance (across the hub) is possible with the Drill Guide Balance System. With this system, the mounting hole is moved to coincide with the exact center of the propeller by using plates that will locate the mounting hole. One plate has a bushing with an i.d. of either 3/8" or 5/16" for accurate drilling.

List of Parts: 1 Balance Rod, 2 cones, 2 drill guide plates (1 with bushing and 1 without), 2 ea. 1.5" screws, Balance stand with base and risers, and either a 3/8" or 5/16 flat-tip drill.

Equipment Needed: Drill Press

Balancing the Drill Guide Plates

The plates are not perfectly balanced and this must be done before you can begin balancing. With these instructions, you will quickly and permanently balance the plates.

- **A.** Mark the end of the plates so the orientation of the 2 plates remains the same. Use a permanent marker or a make a scratch.
- **B.** Notice that when a cone is reversed on the balance rod, the groove fits into the non-bushed plate. Assemble the guide by inserting the screws first into the non-bushed plate, then attached the second plate. Insert the drill rod through the center of the guide assembly. Now take the cones and place the pointed side on the drill rod into the plate ***with*** the bushing. On the other plate, the cone must be reversed so the groove fits into the non-bushed plate.
- **C.** To check the balance, place the assembly on the stand. The heavy side of the drill guide assembly will be down. Balance by applying a small amount of modeling clay to the light side until balance is achieved.

Propeller Balancing

- **A.** The propeller is loosely fitted between the drill guide plates. Again, the cone must be reversed on the non-bushed plate. The screws should be just snug enough so that the drill guide can be moved slightly on the propeller hub.
- **B.** We suggest balancing the prop in the horizontal position (tip to tip) first. Move the guide toward the heavy blade until you are satisfied with the horizontal balance. Next, check for chordwise balance in the vertical position, and move the guide toward the heavy side until balanced. **Note**: If the propeller cannot clear the base, move a riser on the balance stand into the "over the edge" position.

C. It will probably be necessary to go back and forth between horizontal and vertical balancing to find the exact center. This is done by making increasingly smaller adjustments to the drill guide plates.

Drilling the Propeller

A. The screws are now tightened and the propeller is ready to drill. A special drill is provided which has had the point modified so that it will not feed itself too rapidly into the propeller. Recommended speed is 800 to 2000 rpm. Follow manufacturer's instructions for safe operation of the drill press.

B. Using the tightened drill guide with the bushing side up, slowly drill out the hole. You are moving the center hole slightly to coincide with the propellers' center. Moving the hole will not affect propeller performance.

C. If the hole you have drilled is larger than your engine shaft, you can buy aluminum tubing to make bushings. This type of tubing is generally available at local hobby shops. (K&S Tubing)

D. After drilling, remove the plates and replace the propeller cones (both tips facing the hole this time) and check the balance. Your propeller is now completely balanced and ready to go.