GRINDING & FILING A BLADE WITH DIHEDRAL

The blade boxes should be made first. Then the blades can be carefully sized to fit without bind or slop.

As needed, trim the blades to length with ends squared.

You'll need a bench grinder, vise and a metal file with sharp teeth. A micrometer or calipers set at .375" (3/8") will also come in handy.

Using ½" blades, the objective is to grind and file down 1/8" from ends to center on the top edge and up 1/8" from center to ends on the bottom.

Cover a blade with ordinary masking tape and trim the tape to exact blade perimeter. Mark the exact center with a vertical line. Bisect the line 1/8" down at the top. At the ends make marks 1/8" up on the bottom. The objective is to end up with angled blades with edges parallel to each other at 3/8" spacing + or – a hair or two as needed to snugly fit the boxes.

With a sharp blade and using a straight edge, cut through the masking tape as shown below to provide visual reference lines.

In grinding, the blade can get too hot to handle. Easy does it, taking off a little at a time. Don't overdo it or the properties of the hardened and tempered blades will be altered. Have a pan of cool water handy to immerse the blade in or place it between metal plates to cool it. Position the grinder rest(s) close to the grinder wheel(s). It's easier to remove material from the bottom, so do that first to get some experience. Keep the blade moving, making passes <u>parallel</u> to the edges of the tape.

When most is removed with the wheel, clamp the work in a vise so the edge being worked on is firmly held upright in the jaws. Work the file flat on that edge in long forward only strokes. Lay a straight edge on the filed edge. Hold up to the light to check for high spots. File down as needed to get the blade edges straight and smooth.

Repeat the procedure on the other edges. When you are getting close, check the work with a calipers or micrometer, if available. You want the filed edges to be parallel to each other and fit the boxes. If the blades won't go in, keep filing so they fit without vertical play or bind.

A rule of thumb is that a 1/16" rise in 3-1/2" is one degree. ¼" rise in 3-1/2" is 4 degrees. If blades are 7" long, the angle is that. If 8" long, the angle is 3.5 degrees.

File 3 explains how a little more dihedral can be obtained when the wrapped outboard halves of the blade boxes are secured in the tip section cores.