



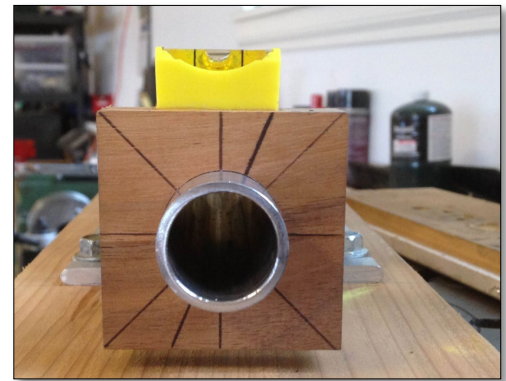
Tools for Marking Top Dead Center (TDC)

by Team Skunkworks

One of the challenges we face when repairing or updating our Kasperwings is how to locate a series of holes along a length of tubing, (i.e. spars), and how to drill these holes so they all line up. Harder yet is attempting to align and drill off-set holes. The Kasperwing factory used jigs developed specifically for this purpose but, unfortunately, a lot of us don't have the know-how or desire to build specialized tools for 'one off' production.

Note: I want to emphasize that there are a lot of gauges and tools out there for locating, marking and drilling holes. This article will touch on just a few of the tools we have used with varying degrees of success to locate and drill TDC on spars, keels, main struts and other multi-hole tubing parts.

Tools to locate TDC: This first row of manufactured or home-made gauges help locate a line at TDC along a length of tubing. Secure the tube so it doesn't rotate as you position the jig along the length.



Locating Holes: Once you've marked the TDC line along a length of tube, the Snap Collars will allow you to mark holes at the top and bottom (180 degrees apart) of the tube you intend to drill, or at any angle in between.



Rather than drilling through and through, I sometimes find it faster and more accurate to mark and then drill holes from both sides.

Drilling for Accuracy: To ensure that a series of holes are centered along--and perpendicular to--the TDC line, it is important to secure the tube while you are marking and drilling. Below are two tools/jigs; one that keeps the marked tube centered in a drill press and the other that's clamped directly to the tube, acting as a guide to keep the drill bit at 90 degrees to the work surface. This one is especially handy if you need to drill the part 'in place.'



Technique: In another article, we will show examples of how some of these tools are used, which methods were consistently more accurate and lessons we have learned from doing it all wrong.

...to be continued.