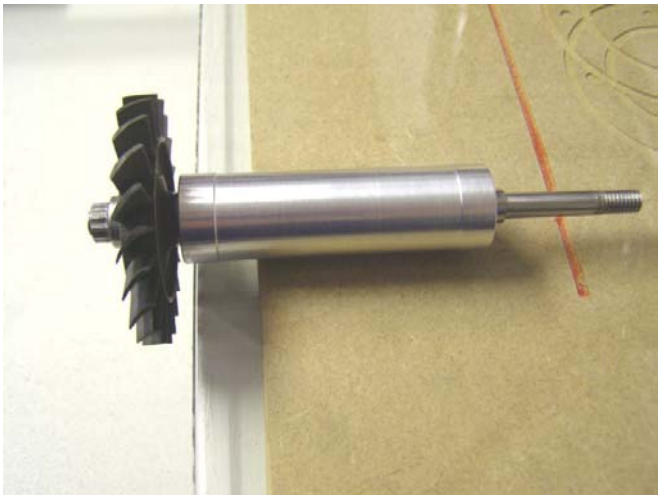
Hand Static Balancing

Not having access to a dynamic balancer, I used the tried and true method described by Wren in the instruction manual. Both the compressor (not shown) and the turbine wheel were balanced in this fashion.

A simple aluminium tube was turned for this exercise. Internal diameter of the tube to suit external diameter of the Bearings.



The bearings and appropriate spacer are mounted on the shaft, along with either the turbine or compressor wheel and nut.

I used a set of standard cheap 688 bearings after popping out the shields and cleaning them out with white spirits. This has the added benefit of keeping the good expensive ceramic bearings free of any contamination prior to use.

The shaft must be absolutely free-wheeling, with almost zero drag, for this to work properly. I occasionally added drops of white spirit into the bearing with a syringe to help things along. I also found that spinning up the shaft with the airline and holding it there for a minute or so, helped the bearings seat a bit and allowed even less drag.

The tube is placed on a flat surface, (piece of glass) with the wheel over the edge, and with fingertip pressure gently rocked back and forth through perhaps 10mm of distance. The heavy portion will work its way to the bottom. This is marked with a felt pen, and repeated to be sure it is an actual heavy spot.

The turbine wheel has a balance ring cast into the root of the wheel. This is slowly ground away with a dremel, and the process repeated until you start to find the wheel dos'nt settle in the same spot anymore. It does take time and a lot of patience. Use fine emery paper or a scotchbrite once you are getting close, so as not to leave any rough edges.

For the compressor wheel, the back face is gently ground or sanded. I have discovered unless the compressor has had some damaged cleaned up or known to be out, it is best to leave it alone, as the factory balance especially if fitting a new one, is better than you can achieve by hand.