

Nozzle Tuning Data

The basis of nozzle tuning is to get each of the cylinder EGT's to peak at the same fuel flow. Your aircraft must be equipped with EGT information on each cylinder and fuel flow information. A digital flow meter is preferred. Adjusting nozzle size to get all the EGT's to read the same number is not correct and can in fact damage the engine.

To gather correct data for nozzle tuning, set a cruise power setting. Typically 24" MAP and 2400 RPM. Set the mixture to be 0.5 GPH richer than peak on any cylinder. At this setting record all the EGT's for each cylinder. Lean the mixture 0.2 GPH and record all the EGT's again. Lean the mixture an additional 0.2 GPH; record all the EGT's again. Continue leaning the mixture 0.2 GPH and record the EGT's until all the cylinders have peaked.

It is a good idea to get multiple sets of data to compare. That is, take the data at 24 square at 3500 ft. Then set a cruise power setting at 3500 ft. and take the data (2300 RPM and 21" MAP as an example). Then climb to 8500 ft. and set the same power setting (2300 and 21") and take the data again. While the EGT numbers will be different, the trend of which cylinder peaks first and last should be the same. If not, then additional analysis must be done to determine why this is happening. During these tests, do not exceed the engine manufactures recommended cylinder head temperature limit.

An alternative method although not as accurate is to lean each cylinder to peak and record the fuel flow at that point. You will get the same data, but since the EGT reacts slower than the leaning process you may go past the peak and not know it. This is especially true if an engine monitoring lean find function is used. We get more accurate data taking the EGT data manually. If you use an automatic data acquisition function, allow 30 seconds or so at each fuel flow setting so the EGT value can stable out.

After the data is taken, we determine which nozzles to change to get all the cylinders to peak at the same time. You will notice that the EGT number at peak may not be the same for each cylinder, **THIS IS NOT IMPORTANT**. The cylinders that peak first (higher fuel flow) are the lean ones; the cylinders that peak last (lower fuel flow) are the rich ones.

Getting all cylinders to peak within 0.2 GPH is ideal.

