

Chapter Four

The proper technique for leaning with a single-probe EGT as displayed in Figure 4-13 is applicable to aircraft equipped with either fixed or constant-speed props. Beginning at full rich, the pilot slowly leans the mixture while watching the EGT gauge. As the mixture becomes leaner, EGT increases until the indicator peaks and then reverses. At that point, the pilot should enrich the mixture until it again peaks, stopping 100 degrees on the rich side.

The multiple-probe system, such as the one in Figure 4-14, displays an EGT for each cylinder, which permits actual determination of the leanest cylinder for existing conditions. The initially higher cost of a multiple-probe system is more than offset by fuel savings and reduced cylinder and piston maintenance. To lean, the pilot must first set cruise power for the appropriate altitude and then rotate the EGT selector knob to see individual cylinder temperatures. After determining which has the highest EGT, the pilot slowly leans to peak EGT on that cylinder. The very act of leaning will change which is the leanest cylinder, so a recheck of all cylinders is mandated. The pilot rechecks each cylinder reading and slightly enriches the mixture while monitoring the EGT gauge. If EGT drops, the cylinder was running on the rich side of peak, which is fine. The mixture is returned to its original setting. If the EGT rises, the cylinder is operating on the lean side of peak, and running leaner than the original reference cylinder. The mixture is reset to peak EGT for this cylinder and the process continued until no other cylinder EGT increases are detected. While tedious at first, practice greatly reduces the time involved, and the benefits are well worth the effort. The process must be repeated with changes in power or altitude.

The EGT gauge is divided into 25-degree F increments, with a major mark every 100 degrees and only measures relative temperature, not absolute. During preflights, check the thermocouple probes and stainless steel clamps, which are approximately 3 inches from the exhaust manifold flange of each cylinder. It also is important to check the integrity of the wire leads.

In addition to proper leaning, the EGT gauge indicates numerous in-flight problems. A decrease in both EGT and CHT indicates probable induction system blockage—perhaps icing. A decrease in peak EGT and an increase in CHT indicate detonation. A rapid increase in EGT to off scale and a rise in CHT indicate preignition. Some systems simultaneously display the EGT of each cylinder, allowing the pilot to keep a constant vigilance.

Graphic Engine Monitor

Taking things one step further is the graphic engine monitor, which simultaneously displays EGT and CHT for all cylinders. In addition, it automatically finds peak EGT for the leanest cylinder and alerts the pilot to a gradual or sudden rise in any one or all cylinder's EGT. It also is an excellent diagnostic tool for problems in ignition, fuel injection, improper fuel use, fuel distribution, and engine-failure verification in multi-engine aircraft.