In many cases, the history of an airplane is as important as its symptoms. For instance, if there has been a steadily increasing magneto drop over time, the problem could be old plugs, but a sudden increase could indicate ignition harness or magneto trouble.

Similarly, a steady increase in oil consumption over a long period is a sign of normal wear leading slowly toward an engine overhaul. If, on the other hand, there is a sudden, dramatic increase, that points to a more pressing problem. Hopefully, a visual inspection will turn up an oil leak that is easily fixed. If not, do a compression check for valve, ring, or valve-seat trouble. You might even suspect improper mixing of two different types of oil.

Normal wear over time increases tolerances between moving parts, so vibration and noise eventually will appear. Such irritants, if accompanied by a significant increase in oil consumption, may indicate that time for overhaul is at hand. Localizing such noises and vibrations can be of great help to the mechanic. In addition, it is helpful to know under what speed, power, and aerodynamic configuration the noise and vibration occur.

Not only is the health history of the engine important, but so is the operational history. It is of immense value to the mechanic to know how the airplane has been operated. Examples of operating conditions that will have a significant effect on the life expectancy of the engine are excessive high-power operations such as a towplane; regular operation from unimproved surfaces, particularly in dusty conditions; and any nonstandard operating procedures such as routine takeoffs with less than rated power.

Every airplane owner eventually will be faced with the question of overhaul. As your engine approaches TBO, there are several options, all with very predictable results. It is worth noting that no airplane escapes this "moment of truth," and the owner who flies "cheap" without an hourly allotment for engine replacement will have a far greater moment of truth than the one who has set money aside for the contingency. In addition to operating the airplane in accordance with the POH, the prudent owner will conduct 50- and 100-hour inspections, which have been proven to extend TBO and cut down costs in the long run.

Magneto

Preventive maintenance should include a timing check at 100 hours or annual inspection, whichever comes first. Routine maintenance typically is at 500 hours. At that time, the mechanic checks, among other things, contact point assembly burning and wear, distributor gear carbon-brush wear, cracking and chipping, and integrity of the impulse coupling shell and hub. A magneto always should be overhauled (or replaced) at engine overhaul or any other time conditions warrant it.

Cooling Systems

For the most part, preventive maintenance of the cooling system couldn't be simpler. Routinely check system integrity, with emphasis on keeping the entire airflow path free of obstructions. Also, routinely check the structural integrity of the baffles and fins.