

## Chapter Four

Find a good, reliable way to determine fuel quantity, such as a fuel dipstick. Fuel gauges, notoriously inaccurate, should not be trusted. Assuring the proper type of fuel also is important. Using fuel with a higher octane rating than necessary on a regular basis may cause excessive lead fouling; too low a rating could result in detonation. The key here is the fuel color, and you can check it by draining some fuel into a plastic see-through cup. While checking the color, also look at the quality of the fuel. It should be clean, evenly colored, and transparent, without sediment, dirt, or water. Any presence of water is a problem; it is distinctly visible and will collect at the bottom of the plastic cup. Keep draining and taking samples until there is no longer a trace.

### Cooling System

For the most part, preflighting the cooling system is a matter of looking for the obvious. Baffles should be periodically checked for proper alignment. Missing or broken baffles should be replaced. Cylinder and cylinder head cooling fins create the majority of engine cooling, so any problems should be brought to the attention of your mechanic.

Airflow blockage is another common problem that should be considered on every preflight. There are three areas of concern: intake, inside of the cowling, and exhaust. Probably the most common blockage is a bird's nest in the air intake or exhaust area. This can be solved by purchasing and using air intake plugs that completely fill up the air intake area, preventing birds or anything else from getting in.

The exhaust area can be conveniently closed up if the airplane has cowl flaps. Otherwise, make sure to carefully check this area because birds are just as liable to build a nest there. Less obvious is a blockage actually within the cowling. I once had a collection I would show students that included red, green, blue, and dirt-gray shop towels, an instruction manual for an engine compression tester, the beginning of a bird's nest, and a torque wrench.

### Magneto System

Checking the condition of magnetos can be accomplished in two ways: grounding check and differential check. As explained previously, magnetos are connected by a primary wire (P-lead) through the magneto switch to ground. Its purpose is to provide an internal path of least resistance, rendering the magneto inoperative when the switch is turned off. If the P-lead fails, the magneto stays "hot." The significant drawback of this system is on the ground, where a "hot" mag patiently waits for someone to come along and even slightly turn the propeller, causing the impulse coupling to produce a spark that could make the engine roar to life.

To check for proper grounding of the magneto, set the throttle at idle and rapidly move the mag switch from BOTH to OFF, then back to BOTH. You should hear a momentary engine failure. If there isn't one, then one or both mags are hot and you need to find a mechanic.

Incidentally, P-leads go to specific mags and are not interchangeable. During start-up, there is insufficient piston momentum to overcome normal "advanced" sparking