

Chapter Nine

PREFLIGHT

Preflight of the propeller should always begin with checking to make sure the mags and master switches are OFF. Even so, always stay out of the prop arc during your preflight and never lean over the prop. After visually inspecting for corrosion, while standing clear, grasp the blade tip and test for looseness by pulling fore and aft. Some movement, called *blade shake*, is normal for constant-speed propellers because of their design. Run your hand over the face and back of the prop and your fingernail over the leading and trailing edges searching for irregularities of any kind. Nicks in the blade radiate lines of force outward, causing irreversible damage. If small and caught early enough, they may be dressed by a mechanic. If a small nick occurs while the airplane is in a location where no mechanic is available, as an emergency measure only, you might very lightly dress it with a fine, half-round file, just enough to smooth the jagged edge. Do not use emery cloth because particles will become embedded in the soft aluminum material and lead to corrosion. Then fly the airplane to the nearest A&P. If in doubt about its severity, don't fly it. Blade failures typically occur within inches of the prop tip, but there have been cases of failure as far inboard as the hub, so don't be fooled.

Contrary to popular belief, most prop spinners are not optional items, though it is not uncommon to see them inexplicably missing on aircraft. They are typically used to assure smooth cooling airflow into the cowling. Spinners should be checked for cracks, security of attachment, and evidence of oil. Oil indicates crankshaft seal failure. While standing near one end of the prop, sight down one tip across the blades to the other tip and check for alignment. If there appears to be a bend, you should perform this simple blade track check, which assures one blade tip follows the other in the same plane.

After double-checking that mags and master are OFF, point one prop tip directly down. Block up a smooth board directly under the prop tip and pull gently on the tip. Mark the spot on the board with a pencil, push the tip gently backward, and mark that spot with the pencil. Without moving the board or the airplane, rotate the other prop into the down position and repeat the procedure. The two sets of marks should not vary by more than $\frac{1}{16}$ th inch. If they do, have it checked by a mechanic.

Safe operation of propellers is mostly a matter of common sense. Without a doubt the prop is potentially the most lethal part of an aircraft, even when the engine is not running! Connected directly to a reciprocating engine, moving the prop means turning the engine over. That includes turning the mags and pulling air through the carburetor. Any number of system-related failures, ranging from a broken magneto P-lead to a fuel leak, could cause the engine to start unexpectedly. Turning a prop by hand, even backwards, should always be considered unsafe and avoided if possible.

The old routine of putting a prop in the vertical position to indicate a refueling order is an accident looking for a place to happen; use a windshield sign instead. And again, pulling an airplane around by its propeller is not a good idea. Use a towbar; it's much less expensive and time-consuming than an airplane out of control on the ramp running over your unattached arm. Another worthwhile rule of thumb is never get near a prop with a nonpilot in the airplane; there have been too many instances where a passenger has accidentally turned on the mags, pushed a mixture lever forward, or even hit a starter.