

## Chapter Ten

the tires traction on the ground. There are a number of different types of tread, such as all weather and ribbed. The all-weather tread is a diamond-shaped pattern grooved into the surface of the tire and is usually found on aircraft that operate often on grass or dirt strips.

Ribbed tread tires are by far the most common today on light, general-aviation aircraft. They are characterized by parallel, continuous grooves that run along the outer circumference of the tire. Designed specifically to operate off hard-surfaced runways, water will go up into the grooves, allowing the tire surface to touch the ground for better traction. Ribbed tires are known not only for their excellent traction but also for their long service and excellent directional stability.

The sidewall is actually a protective rubber covering that goes from the tread to the bead. Its purpose is to protect the carcass exposure to moisture, scrapes, scuffs, cuts, or bruises.

### Tire Wear

Tires are designed and built to be remarkably strong and flexible, so catastrophic failure is not a common problem, though occasionally it does occur. Excessive wear, on the other hand, is the biggest problem with tires.

Ask the average pilot what is the most significant factor reducing tire life and you'll probably get the answer, "Hard landings." There is no question that hard landings make an impression on pilots, passengers, landing gear, and airframes, but hard landings are less of a problem for tires than pilots may think. Aircraft tires, much more flexible than their automobile counterparts, are designed to flex as much as 35% from their original shape. This allows for landings that are a lot harder than the average pilot can handle!

The real killer for tires is heat. The more flexible the tire, the greater the internal heat generated as a result of stress and friction. If you have the slightest doubt about that, drive your car a half mile down your street at 60+ mph, and then, while the nice officer is writing the ticket, feel the tires. The heavier the vehicle, the more heat that will be generated; the more heat, the shorter the life of the tire.

There are several ways to minimize the heat problem, but they tend to be unpopular with pilots:

1. Always keep tires properly inflated.
2. Always taxi as slow as practical. The slower you go, the less stress on the tire and the less it will deflect, which translates into less heat buildup.
3. Keep ground maneuvering to a minimum. When possible, plan to land so you will roll out close to your destination on the airport.
4. Reduce, and if possible eliminate, braking. Not only does this save tires, it also saves brakes. Braking causes friction between the tire and the ground, which leads to a fast buildup of heat. Also, the brake itself creates a significant amount of heat, part of which will transfer to the tire. A touchdown and long rollout without brakes is preferable to a short ground run with brakes, assuming there are no obstructions looming at the end of a short runway.