Aircraft tires, too often taken for granted as one of the 'wear ever' features of the lightplane, actually are among the more sensitive to neglect and mistreatment. But proper care can assure good service

■■ It started as a routine approach to landing at a small, uncontrolled airport. Pattern turns were square and the rate of descent was moderate and steady. Then, as the plane crossed the threshold of the runway, the pilot executed a slight turn and made a perfect landing on the grass.

"I always do it this way when I can," he explained to a surprised passenger. "It makes the tires last longer."

The pilot probably thought he had a good idea. Actually, he was greatly increasing his chances for needing an early tire replacement.

The amount of wear sustained by a small airplane tire during landing on a hard-surface runway is nothing compared to the chance the pilot takes of ruining a tire completely by striking some sharp object that might be hidden in grass not intended for runway use.

Given proper care, airplane tires can perform efficiently and provide good service through as many as 500 landings, depending on the size and weight of the aircraft. But tires also succumb to mistreatment more quickly than almost any other aircraft component.

Tire manufacturers strive constantly to minimize this possibility. Extensive development and testing programs yield tires that meet or exceed FAA and airplane manufacturers' performance requirements. But the very nature of materials used in tires dictates that survival depends as much on in-service care as on the built-in qualities of the tire.

Giving tires proper care is probably the easiest maintenance task you'll ever perform on your airplane. Mainly, it's a matter of keeping tires properly inflated, avoiding hot landings, excessive brake use, or ground operations on rough or debris-covered terrain, and making regular inspections to be sure tires are in good condition.

Inflation pressure should be maintained at levels specified in airplane manuals or provided by aircraft tire dealers. Pressure should always be checked with a gauge, since visual observation sometimes can be misleading.

To carry required loads, airplane tires must be able to flex more than twice as much as automobile tires. The soft construction that provides this flexibility can make a tire appear underinflated when, in fact, it is carrying the proper amount of air. Adding more air would reduce the tire's flexibility which, in turn, would reduce tread life.

Even more damaging is underinflation, which permits too much flexing. This can cause the tire to overheat, resulting in premature failure. Underinflation also makes a plane difficult to handle on the ground.

Inflation problems develop most often in cold weather. Temperature variations, such as those between a warm hangar and a cold flight line, cause considerable changes in air pressure.

Air pressure loss in an airplane tire generally is estimated to be 1% of total pressure for each 5° drop in temperature. Therefore, airplanes kept indoors should have tires overinflated in the hangar, based on the difference between hangar and outside temperature, before flight is attempted.

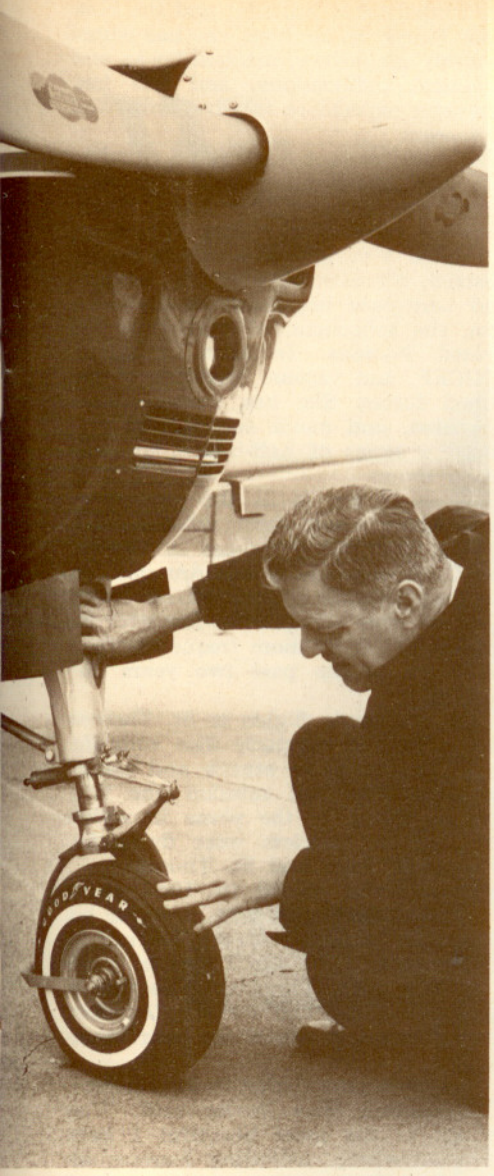
Frozen valves are another cause of cold weather air loss. To correct this, filters should be used on all air inflation lines to prevent moisture from getting into valves. Rolling the plane into a warm hangar for a few hours may solve frozen valve problems in some cases, or replacement of valves may be necessary.

While a tire gauge is the only accurate way to spot-check inflation, even a casual look at the tread can tell you if inflation pressure is being kept consistently too high or too low. Excessive tread wear in the shoulder area is an indication that the tire has been run while underinflated. Excessive wear in the center of the tire suggests overinflation.

The problem of foreign object and rough surface damage is best solved by prevention. When you're not sure of ground conditions, go slow on taxi rolls and make landings as light and smooth as possible. Broken glass, nuts, bolts or other pieces of metal, chuckholes in runways or taxiways and even sharp rocks can cut or bruise tires.

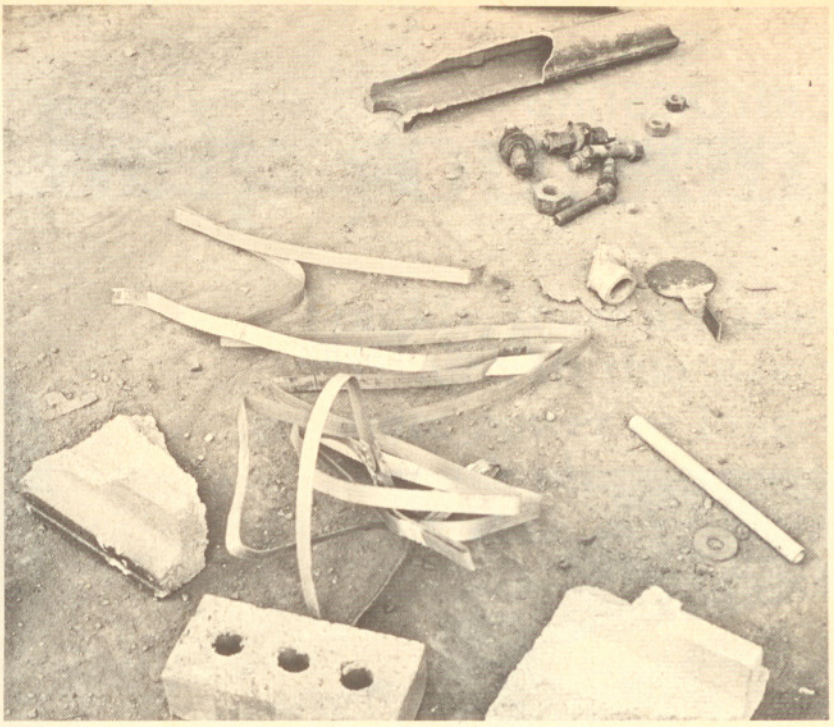
Tire inspection—your best defense against unexpected trouble—should be regular and thorough. Primarily, you should search for signs of cuts and bruises in the tread area. Surface cuts may be harmless, but they should be kept under regular surveillance to make sure they don't grow.

Tread depth on a tire also is important. Although airplane tires don't have to grip the road in the same manner as car tires, the tread grooves do permit water to pass from under the tire. This minimizes the danger of



Careful inspection of tires pays dividends in longer wear and service.

GOODYEAR NEWS BUREAU PHOTOS



Some of the debris that must be avoided to insure longest service from your tires. All of these items were gathered from within the boundaries of an airport and any one of them could mean an abbreviated life for a lightplane tire.

Care For Your TIRES

by PATRICK PETREE / AOPA 317103

skidding or hydroplaning on wet runways. According to Goodyear, an airplane tire with less than 20% of its tread remaining will react practically the same as a completely bald tire in trying to control the plane on a wet surface.

As tires age, you may detect small cracks on the sidewalls. This is known as weather checking. It is no cause for concern unless the fabric cords are exposed.

Another inspection goal should be detection and removal of any traces of gasoline or oil that may collect on tires. Mineral fluids damage rubber. If these cannot be removed with a dry rag, soap and water should be used.

If you put your plane in storage during winter months, care should be taken to locate a cool, dry location away from electric motors. Electricity changes oxygen to ozone, which prematurely ages rubber.

The reward for proper care procedures is tires that will let you down smoothly and safely many times. □

Underinflation causes tires to generate excessive heat on landing or takeoff which can lead to breakdown of cords and premature tire failure. It also results in hard to control ground characteristics.

THE AUTHOR

Patrick Petree is a private pilot whose job is public relations for the Aviation Products Division of The Goodyear Tire & Rubber Company. Prior to joining Goodyear, he worked as a television weathercaster in Kansas City, Mo. This daily work with weather led to an interest in aviation, and he paid for flying lessons by working part-time as a flight instruction salesman and sales promotion manager for State Line Airport in Leawood, Kan., a Kansas City suburb.