



**LISA TURNER**

COMMENTARY / AIRWORTHY

# Kick the Tires

## Tips and Myths

BY LISA TURNER

**THE INVENTION OF THE** wheel was certainly revolutionary. But our designs for what to wrap around that piece of stone confounded us for years. Constant tradeoffs between wear versus handling, cost versus efficiency, etc., over decades refined the invention to where you can now buy specific solutions for your mission. Backcountry? There's a tire for that. Jet aircraft? There's a tire for that. Small aircraft? There's a tire for that.

Tires are so ubiquitous we totally forget about them. And, we don't like being reminded about tires.

"Did you check the tire pressures?"



"Oh, gosh. I forgot that. They should be fine. I checked them last month."

You may have noticed that this is the usual reaction whether you're leaving in the car or the airplane for vacation. Thank heavens our cars no longer have fender skirts (wheel well covers); the tires would be checked even less often. The 1952 Nash Rambler had non-detachable fender covers. It must have been fun to inspect and fill those tires. Similarly, if an airplane has wheelpants, the tires will get about the same amount of attention — very little.

Why do we care about the tires? A flat on the road is one thing. We can stop and change the tire. When we land an airplane, a tire takes on the force of a wheel accelerating from zero to 60 mph or more as we touch down. Aircraft tires are subjected to high directional forces on landing, especially if we're dealing with a crosswind we have not corrected for.

Here are tips for keeping your tires airworthy, with some fun in a myths quiz at the end.

### TIP 1 — INSPECTION

You already know to check tires on your preflights. This includes taking more than two seconds to actually look at the tires. You may need to move the airplane from its position to see all of the tire. We don't typically remove wheelpants on a preflight, but if you haven't inspected and aired the tires in the last few months, it's worth taking a little extra time to do a full inspection. Use your judgement on this. If you've inspected them recently and were flying yesterday, you can be more cursory.

Consider doing a post flight inspection when you return from flying. It's not overly time consuming and may reveal an assortment of issues you won't see on a preflight. Tire wear patterns come to mind. Tires can be damaged by debris on taxi, takeoff, and landing. Look for cuts, cracks, worn spots, bulges, foreign objects embedded in the tread, and general tread wear. If you see damage or wear that bothers you, have your mechanic render an opinion.

Check the bead — where the tire meets the wheel rim. This is an overlooked area that can reveal cracks or breaks. Damage to the bead can cause the tire to loosen on the rim, leading to movement and folding or pinching of the tube with sudden failure — especially on landing — that can cause you to lose control.

## TIP 2 — HANDLING

Over time, you'll get a feel for the ground handling in your airplane, and how it feels when you take off and land. This experiential blueprint will help you notice when something is going wrong. An example is a flat spot that your tires can acquire in an emergency braking situation. Once the animals on the runway have disappeared into the trees, you forget about them but now you feel a difference in the ride. Check the tires out after events like these and when you get a sixth sense that something is wrong.

Because side loads on tires produce heat and accelerated wear from flexing, straighten the airplane out just before touchdown. As students, we kept crabbing into the wind because we were learning how to use the controls. Continuing to do this later can destroy a set of tires in no time. Be disciplined using controls, especially rudder, to land without high side loads.

Tailwheel aircraft are unforgiving in these same drifting situations. Instead of saying "Oops," as we might in our Cessna 152, we will find ourselves in a ground loop in a Cub. Save yourself and your tires by practicing good landing technique for the aircraft you're flying. Then stay attentive after landing.

Think ahead on braking and pivoting the aircraft. Riding the brakes will accelerate tire wear in addition to brake wear. Stomping the brakes can cause



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## QUIZ — True or False?

1. You should never consider tire retreads for your airplane if you want to stay safe.
2. Save yourself money by reusing the tubes when you replace the tires.
3. Tire blowouts cause the majority of accidents related to landing gear and tires.
4. The FAA mandates the use of nitrogen to fill small aircraft tires.
5. You can use wheels designed for tubes with tubeless tires.

### ANSWERS:

1. False. Tire retreads can be a great way to get strength and durability at a lower cost. Do your research to make sure you're ordering from a reputable and well-known company. If you're thinking of purchasing tire retreads for a retractable gear aircraft, buy them contingent on doing a test for clearance going into the wheel wells. It's not a fun day when your new tires get stuck in the well. Tires expand slightly over time, so if it's tight now, it will only get tighter later.
2. False. You may save yourself money, but you may also end up with a failure sooner than you thought you would. It's like changing the oil filter but not the oil. Tubes stretch over time, making them more susceptible to pinching and folding cuts.
3. False. Sudden tire blowouts are rare. Most tire failures provide warning that can be caught on thorough inspections. Flats on landings are often caused by underinflation that causes the tube to get pinched and cut. If you continue to "fly the airplane" after landing, you'll be on guard for any strange behavior and may be able to avert running into the weeds with a flat.
4. False. There is no reason to not fill your tires with nitrogen, but it's not necessary, and we have enough other things to do than worry about it. Commercial aircraft do use nitrogen. (FAR 25.733 requires that all tires on braked wheels on airplanes heavier than 75,000 pounds be filled with dry nitrogen.) Nitrogen reduces the loss of tire pressure due to permeation through rubber over time by about a third, reduces moisture, and does not support combustion. Some car dealers are selling new cars with nitrogen filled tires; while they do hold pressures longer than regular air, my opinion is that it's a minimal gain for the extra effort.
5. False. You can use tubes with wheels designed for tubeless tires, but not the other way around, since the likelihood of leaks is high due to the wheel design.



the wheels to lock or skid, leading to loss of control. Gentle and thoughtful control input will reduce wear on all your aircraft systems.

### TIP 3 — EXPERIMENTAL AIRCRAFT

Our homebuilt test phase is often combined with pilot inexperience. As we taxi about the airport and ease into our first flights, the last thing we're thinking about are the tires and brakes. Fast landings, poor crosswind control, and heavy braking may characterize those early hours when we're thinking only about getting safely on the ground amid the heart pounding.

The first 50 hours should include thorough inspections across the board. Don't forget the tires. Leave the wheelpants off to make inspections easier.

### TIP 4 — MAKING CHANGES

If you own an experimental aircraft, then you have great latitude to try different tire configurations. If you decide on different tire, wheel, and brake combinations, remember that they may alter weight and center of gravity. Check with the manufacturer and with the builders' group on experience with different combinations. Recalculate your weight and balance once you've settled on your choices.

In certified aircraft, you are confined to FAA-approved parts, and this includes tires. Check your pilot's operating handbook (POH). It will include both a size, such as 6.00-6, and a ply rating, and sometimes a brand and model recommendation. Aircraft tires are approved under the FAA's technical standard order system.

Want to do your own work installing new tires and tubes? The FAA includes these tasks on the list of approved owner maintenance items.

### TIP 5 — INFLATION

After inspection, the inflation pressure is critical to the handling and longevity of the tires. You already know this from your experience with your car or truck tires. For some reason, we hate checking tire pressures. This can be because we have to get on our hands and knees, a gauge that's difficult to read or use, or we forgot what the pressure is supposed to be. To get around this, make the chore easier. I bought a compact and lightweight battery-operated air compressor I keep in the car. I wrote the pressures for the airplane on some masking tape and put that next to the specs for the car. When I fly, the portable goes in

my bag, and there is simply no excuse anymore to not check pressures. I use a calibrated gauge to cross-check the compressor gauge.

While tire underinflation and overinflation in your car or truck means accelerated wear and poor handling, in your airplane it can cause problems serious enough to send you into the runway lights or off into the weeds. Use the setting your POH or maintenance manual advises, or the manufacturer's advice if you have an experimental. The recommended setting can be different from what is on the sidewall of the tire. And don't misread "MAX pressure" on the sidewall for filling pressure. Finally, consider getting 90-degree valve stem tubes if you have trouble reaching the valve.

Tire and tube care can be made simpler if we heed the advice and recommendations given to us by the manufacturer for the aircraft we're flying. Follow these tips and remember that you're taking off and landing on these tiny patches of rubber. Give them a thorough inspection every time you fly.

Find more information about tires in the Checkpoints column in the January and February 2021 issues, and also via the links at [EAA.org/Extras](http://EAA.org/Extras). *EAA*

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