

## TIRE BUSINESS

# There's more to reading tire tread than Lincoln's head

The penny trick to measure tread depth doesn't tell the safety story, it only give you an indication that your tires are still road legal. (David Manley/Tire Business)

By

**Pam Oakes**

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Many people think it is time to replace a tire only when the tread reaches the wear bars, about 2/32-inch on a tread gauge — or the space from the top of a penny to the top of Lincoln's head.

But tread depth is more than a maintenance number. It is a built-in safety reserve, and it can also be one of the first clues that something else on the vehicle is going wrong.

That is why tread depth deserves more attention. It is one of the most familiar inspections performed on a vehicle, yet one of the least understood.

Drivers hear "2/32-inch" and assume that number tells them everything they need to know. It does not.

Tread depth can affect wet braking, hydroplaning resistance, snow traction, driveline durability, alignment diagnosis, and even legal exposure after a collision.

The reality: A tire can still be legal and be unsafe for the conditions it faces — at the same time.

A big misconception is the belief that legal tread depth equals safe tread depth. But even within state and national tread-depth statutes (they can differ), legality and performance are not the same thing.

Time-to-collision (TTC) formulas point to a higher practical threshold in wet conditions, noting greater hydroplaning risk and reduced wet performance as tread approaches or drops below about 4/32-inch. That means a tire can still pass a legal check and already be operating with a sharply reduced safety margin on rainy roads.

That matters because tread depth is really a measure of how much working tread the tire has remaining.

The grooves in the tread are not there for appearance. They are channels designed to move water, mud and snow fast enough for the tire to grip the road.

As those grooves become more shallow, the tire loses its ability to clear water efficiently. The result is longer stopping distances and increased hydroplaning risk. It also reduces control during emergency maneuvers, especially in conditions where advanced driver-assist systems (ADAS) may already be limited.

Add snow, and there is another dimension to the issue. Many motorists assume that if a tire still has visible tread, it can continue to handle winter driving. But snow and slush performance often deteriorate before the tire ever reaches the legal minimum.

For example, Tesla has published tire guidance for its models that tires below 5/32-inch do not perform well in snow and slush. In practical terms, which means winter capability may be effectively gone while the tire is still technically legal.

That gap between “usable” and “legal” is something drivers — and even repair experts — overlook.

Another not-so-well-known issue is that tread depth can expose vehicle problems that have little to do with the tire itself.

Uneven wear patterns are often the first clues that something is wrong with the chassis, steering gear and suspension or tire inflation practices.

Cupping can signal worn suspension components or imbalance. In those cases, measuring tread depth is not just about deciding whether to replace tires, it is about reading the evidence left behind by the vehicle’s behavior. It is where technicians can miss the larger story.

A tire with 5/32-inch tread remaining may look acceptable on paper, but if the inner shoulder is nearly worn out while the outer shoulder still has usable tread, the measurement alone is incomplete.

Tread depth must be interpreted, not just recorded. It should be measured across multiple points and understood in the context of wear pattern, axle position and vehicle design. Otherwise, the technician risks treating the symptoms while missing the cause.

All-wheel-drive (AWD) and hybrid-BEV vehicles make tread depth even more important. The tread depth differences between tires can change rolling circumference enough to interfere with how AWD systems and stability controls interpret wheel speed. The issue is not simply whether each tire has “enough” tread. It is whether all four tires remain close enough in rolling circumference to work together as intended.

Then there is the problem with the penny test. It is popular because it is easy, but it creates a false sense of confidence. At best, it offers a rough

indication that a tire is near the 2/32-inch range. It does not reveal if the tire is wearing evenly, its performance in rain, alignment issues or whether the tread depths are properly matched side-to-side or axle-to-axle.

The National Highway Traffic Safety Administration (NHTSA) consumer guidance still points drivers toward direct inspection methods and replacement at 2/32-inch, but for real diagnostic value, a tread-depth gauge — measuring more points across the tread — remains the better tool.

Tire quality (build) complicates the discussion. Two tires with identical tread depth may not deliver the same performance because tread compound, channel design and traction characteristics vary by manufacturer and model.

NHTSA's tire information explains that uniform tire quality grading (UTQG) traction grades address wet-pavement stopping capability, reminding us that depth matters but so does the original design of the tire.

Tread depth is part of the performance equation, not the whole equation.

Consumers also tend to assume that modern vehicles will warn them when the tires become unsafe. They confuse the tire-pressure-monitoring system (TPMS) inflation pressure and temperature readings for overall tire health. So, a vehicle can show no dashboard warnings and still operate on tires that are unsafe.

Electronics may appear healthy while the vehicle's only connection to the road is quietly losing effectiveness mile after mile.

A newer development in tire service is the rise of smart tires. Systems such as Goodyear SightLine or Continental's ContiConnect are changing the role of the tire from a passive-wear item into an active data source.

The platforms measure inflation pressure, temperature, load and wear while also generating intelligence tied to road conditions and the tire's contact with the pavement. In effect, the tire becomes part of the vehicle's information network; ADAS sensor-fusion.

Rather than waiting for a technician to discover a problem during a routine service visit, this technology can help identify tire problems in real time.

So, the next time someone says a tire is fine, because it is still above 2/32-inch, the better question is: fine for what? Fine for passing inspection, for dry pavement, for another month?

When it comes to tread depth, the most important issue is not whether a tire is still legal for the road, it is whether it is still physically capable.

That is the real lesson. Tire tread depth is not just a wear number; it is a safety margin in motion.