

What Happens to Performance When Tires Are Worn?

Consumer Reports' tests compare tire performance of full and reduced tread depth

By Gene Petersen
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We know exactly how new tires perform, based on our extensive tire test program. But those results are a best-case scenario and, of course, tires are brand-new for only a short time. So that raises questions: How do tires perform when worn down, and when should they be replaced?

The National Highway Traffic Safety Administration (NHTSA) has found that by the time a tire's tread is down to $\frac{4}{32}$ ", which may take years, tire wear plays a measurable role in accidents. (You can find instructions below on how to gauge your tire's treadwear level.) At this point, a tire is approaching the end of its service life and Consumer Reports recommends drivers begin shopping for replacements.

To quantify how wear changes tire performance, the CR tire team measured the wet stopping performance and hydroplaning resistance of 23 performance all-season tires with full tread, which typically measures between $\frac{9}{32}$ " and $\frac{11}{32}$ ", when new, and compared it against the same model tires shaved to $\frac{4}{32}$ ". Hydroplaning happens when water gets between the tire and the pavement.

What You Should Do as Tires Wear

- Determine if it's time to begin shopping for new tires by placing a quarter, with George Washington's head facing down, into a tread groove. The top of his head to the edge of a quarter is $\frac{4}{32}$ ". If the top of his head can be seen, it's time to start shopping in anticipation of upcoming tire replacement.
- Check our tire buying guide for maintenance tips to keep your tires running optimally. As tires lose tread depth, our testing shows that they'll lose grip on wet surfaces and are more likely to hydroplane. The United States Tire Manufacturers Association agrees: "Tread equals traction—giving your tires a grip on the road, especially in bad weather. Lose too much tread and you could lose control."
- CR tire ratings can guide you to good-gripping and long-lasting tires. If you experience loss of grip on wet pavement, or even hydroplaning, it may be time to replace the tires even if they have not reached the worn-out ($\frac{2}{32}$ " tread) depth.

No matter how worn your tires are, it's prudent to slow down in foul weather. Even the best tires will yield traction to water and the laws of physics.

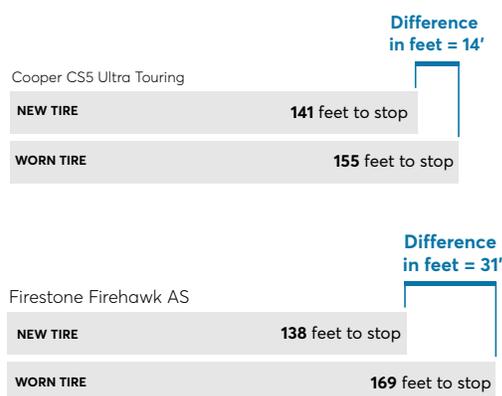
Test Highlights

Our testing demonstrates the range of tire performance an owner would typically experience during the overall life of their tires. While it makes sense that the loss of tread results in the loss of grip on wet surfaces, our testing shows just how significant the loss of grip can be. It's important to note, too, that some tire models better retain their performance as they wear.

The complete results from our tests, including braking distance by model and advice based on our analysis can be found below. Shorter braking distances are better, as they help drivers avoid crashes.

New Tires vs. "Worn" Tires

To illustrate how tire performance can change with wear, we use bar charts that compare wet braking distances between when a tire is new ($\frac{11}{32}$ " tread depth, with these examples) and shaved to simulate wear ($\frac{4}{32}$ "). Start shopping for replacement tires at $\frac{4}{32}$ " tread depth and replace the by $\frac{9}{32}$ ".



What We Found

- **New tire wet braking performance varies by model**, sometimes by a lot. The span in stopping distances is between 127 and 175 feet. That's about three car lengths of variation. If you frequently drive in wet weather, look for a tire model that scores well in our wet braking test.

- **Less tread means longer stops on wet surfaces.** It took longer for a car to stop when tire tread depth was reduced to $\frac{4}{32}$ ". Tires with reduced tread depth took an average of almost 30 feet more to stop on wet pavement compared with new tires with full tread.

As a check to the shaved tire program, we also tested actual worn tires taken from our 16,000-mile treadwear test. Even with relatively low mileage, far below what their warranty covers, wet braking performance declined an average of 6 percent when compared with new tires.

- **Some tires lose more grip than others over time.** One tire model, the Michelin Premier A/S, only went an additional 3 feet in wet stopping performance with tread loss. Other models were not as resilient; one model took 51 feet more to stop with its reduced tread depth.
- **Tires hydroplane more readily as the tread wears.** All tires saw a decline in hydroplaning resistance by an average of 13 percent. As tread grooves become shallow, it's harder to channel water, which is to be expected. As a result, there is a greater tendency to skim on water—so cars hydroplane. As in the wet braking tests, some tire models experienced more of a loss than other tires when it came to hydroplaning resistance.

How We Tested

These evaluations were based on standard tire tests that CR performs on every model it rates.

In the wet braking comparison, we measured the stopping distance from 60 mph on a surface covered with 1.2 mm of water (about the thickness of a dime). That is like stopping in a heavy rain storm, and it is an evaluation that we perform hundreds of times a year.

We also recorded each car's speed when the tires start to hydroplane (losing contact and control) on 10 mm of water. This challenging test is comparable to driving through standing water on a rutted road.

Hydroplaning

Hydroplaning is one of the scariest experiences a driver will face. Consumer Reports expert, Ryan Psczolkowski, reveals to 'Consumer 101' TV show (<https://www.consumerreports.org/consumer-reports/consumer-101-tv-show/>), Jack Rico, how to regain control of a car when its wheels have lost traction with the wet road.

Wet Braking: New Tires vs. Worn Tires

■ NEW ■ TREAD DEPTH; 4/32"

DISTANCE TO STOP FROM 60 TO 0 MPH WET BRAKING, FEET

