

Tire Evaluations: Test to Get the Best

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We've all heard the adage: "You get what you pay for."

In many cases that's true. Yet, when it comes to the tires in your fleet, it may not be the case. With tires, you can actually get more than you pay for, and if you do, you're cutting operational costs significantly since tires often represent the second highest expense following fuel.

Tires constantly evolve and applications vary. They are far from a commodity item, and tire price points don't always tell you the "life" you should expect to get from them. Just because you pay more for a tire doesn't mean you will get higher mileage and more retreads.

When it comes to tires, the only way to determine what's best for you is to test them for yourself. That means developing an on-going tire evaluation program—an extra step that can end up saving you significant dollars. You'll be comparing the tires you currently run with a possible newcomer to your fleet.

At Cooper Tire & Rubber Company, when we test new tires for our Roadmaster brand commercial lines, we benchmark against tier 1 and tier 2 brands. Our tests are macro in scale and we run the same test with multiple fleets. We then compare the data to see how our tires stack up to the competition.

Unlike a tire company that is testing products day in and day out with dedicated technical professionals and sophisticated equipment, most fleets do not have the capability or bandwidth to conduct exhaustive testing. Yet, you can still do a valid evaluation within a fleet and get results that give you confidence in what to expect from selected tire brands.

Steer Tire Evaluation:

To conduct an apples-to-apples comparison, you need to keep all unnecessary variables out of the equation. You should run like-brand and like-model tractors or trucks, and they should be the same age with the same specs. In addition, drivers comparable in skill level should run the trucks. Drivers can impact tire performance in subtle ways. Routes and loads should be identical, or as similar as possible. Choose dedicated long-haul routes. Or, if you're evaluating tires in a regional or local operation, choose similar types of service.

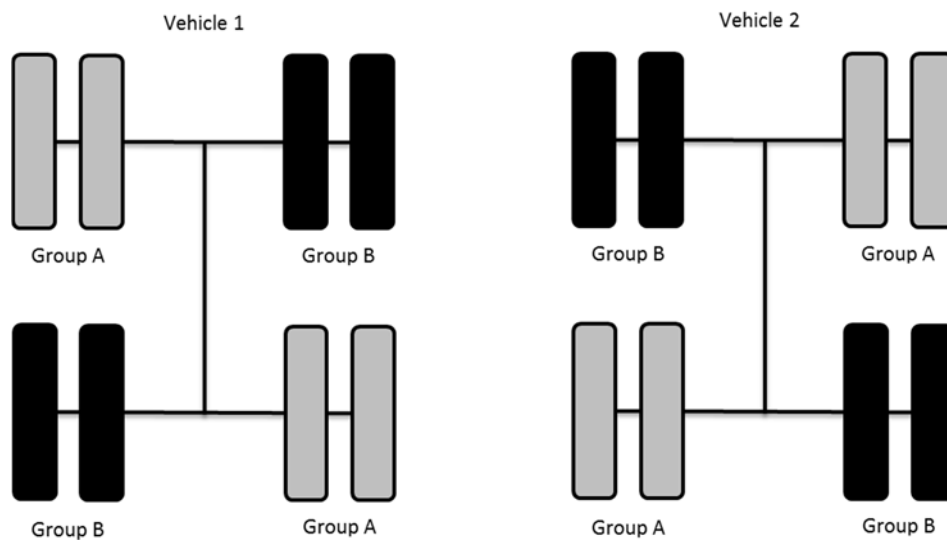
Once proper "like" equipment is identified, you'll want to outfit four of the trucks with your new evaluation steer tire, and outfit another four with the steer tire you're currently running. You'll be doing a head-to-head analysis. There are two reasons to run at least four vehicles: 1. To get a good average wear rate considering any variation in vehicles,

routes, or driver. 2. If you lose a tire due to a road hazard, you will still have three vehicles left running.

Drive Tire Evaluation:

Drive tires are somewhat easier to evaluate. Instead of pitting vehicles against each other, you can use one vehicle to test two brands of tires. The only caveat is that their diameters need to be within ¼-inch of each other. To put that into perspective, you can run one drive tire with 30/32nds of tread depth, and have the competing drive tire within plus or minus 4/32nds of that figure. Any larger variances will cause tire scrubbing and inaccurate results.

With this evaluation, you can run two trucks with eight wheel positions. The key is doing an X-pattern (or cross-axle) on the two rear axles. (Refer to TMC RP230B “Tire Test Procedures for Tread Wear, Serviceability and Fuel Economy) However, don’t run the tires identically on the two trucks—the right rear outer tire historically wears faster than any other drive position tire and that’s because there is a higher percentage of right hand turns, which can cause scrubbing. So, be sure to have brand X in that position on one evaluation truck, and brand Y on the next truck. Also, note that tires on the trailing axle typically wear about 20 percent faster than the forward axle.



Trailer Tire Evaluation:

In the majority of cases, fleets will not buy new replacement trailer tires – they’ll retread an existing removed steer, drive or trailer tire, or move a drive tire to the trailer position.

But, if you have a very large fleet that buys a lot of new trailers and wants to compare two or more different tires, or if you have a fleet policy of not running retreads, then here’s how you can evaluate the tires:

Run at least two trailers for each tire design being evaluated and mount your evaluation tires in a cross-axle alignment – the same pattern as in a drive tire evaluation. Like with the drives, there should be no more than ¼-inch tread diameter difference. Since most fleets run a drop-and-hook operation with trailers, and typically have a 2-1 (or more) ratio of trailers to tractors, it can take a long time to gather data. So, unless you can run dedicated tractors and trailers in the evaluation process, it may not be worth your time. If you do pursue a tire evaluation on trailers, be sure to have hubometers installed to accurately track mileage.

Maintenance Practices:

Once tires are mounted, start the evaluation off properly by having each vehicle undergo a total vehicle alignment on the front and rear axles. Once that's done, you should not have to do a re-alignment during the evaluation period unless you detect irregular wear, or have a suspension issue with a vehicle.

It's important to have the drivers conduct proper pre-and post-trip inspections. And, that means tire inflation needs to be checked properly — not with a tire thumper. Tires need to be gauged to ensure tire inflation pressure is at the pre-defined level for the specific position. To make it easy on your drivers, install flow-through valve caps, so they don't have to spend time taking off valve caps.

What's more, drivers must keep their eyes (and fingers) on the tires to inspect for wear – a weekly fingertip diagnostic (simply running a hand over the tread) can detect signs of irregular wear. Should toe or feather wear be found, for example, it could mean an alignment problem, suspension problem, or bent tie rod.

If drivers detect early signs of irregular wear, your fleet can fix the underlying problem and continue with the evaluation. Be sure to keep record of any wear issues and vehicle adjustments.

Evaluation Periods:

Evaluation units should be checked every 30,000 miles, or every three months, whichever comes first. The first item to analyze is tread wear, and for this you need a quality tread depth gauge that measures to 1/32nd or 1 mm. Electronic gauges with digital readouts are easiest to read. When checking the tire, you should have three points for gauging across the tread face – the outside, middle and inside of the tread. Again, a fingertip diagnostic should be conducted as well and any signs of irregular wear reported. Irregular wear could indicate a problem with the vehicle, as mentioned earlier. If the irregular wear is found to be severe, in the drive or trailer position, rotate the tires on the front rear axle in cross axle design (for example, LRI & O to RFI & O). However, don't rotate side-to-side.

Since deeper tread squirms, wear rates will be faster at the start of the evaluation, then level out toward the end.

Projecting Tread Wear

After six to nine months, or 75,000 miles, you should have solid wear data on your steer tires, which generally last between 90,000 and 150,000 miles. With this wear data in place, you can now make projections on how many more miles the steers will last before they're pulled for retreading. This will give you an apples-to-apples mileage comparison and provide your first cost-per-mile figure on virgin rubber, once you factor in the purchase price.

Since drive tires can wear up to 350,000 miles or better, and trailer tires can offer mileage at 200,000 miles or better, a nine-month check should be a reliable indication of the future. With 90,000 miles under your belt, you should see how many 32nds of tread have been worn off.

Now that you have data on how much tread is worn on your tires, how do you make your calculations?

First, calculate tread wear rate. Tread wear rate = (current mileage – installation mileage)/(original tread depth – current tread depth). As an example, the first test truck's current mileage is 390,000 miles and tires were installed at 300,000 miles. The original tread depth was 30/32nds and the current depth is 24/32nds. So, 6/32nds were worn off. Thus, the wear rate is 90,000 miles divided by 6, or 15,000 miles per 32nd .

Next, calculate projected miles to removal. You'll need the original tread depth of the tire, and the pull tread depth. For drive positions, the pull depth is normally 4/32nds, and in our example, the evaluation drive had 30/32nds of tread. Projected total miles to removal = wear rate x (original tread depth – pull point tread depth). In our example, 15,000 x 26 = 390,000 miles.

In our work, we've found that tires have a better than 80 percent chance to run out to these projections.

Casings and Retreads

With projected mileage in hand, the next step is to understand and get a feel for the tire's next life. And, that's retreading.

If time weren't a factor, you could run a full-blown evaluation getting true mileage figures on your evaluation tires, plus the number of times the tire could be retreaded. This is cradle-to-grave documentation, which is good to maintain as part of normal operations. But, that means years, lots of them, to gain quantifiable data.

Instead, we recommend two things:

First: Look at the warranty on your evaluation tire and compare it against the tire you're currently running. The manufacturer should offer a casing warranty in the event that the tire is not retreadable for certain reasons. The warranties typically range from four to seven years from the date of manufacture, and offer casing credits ranging from about \$40 to \$130 on the "first" retread. Most manufacturers also offer a reduced casing credit

for the second retread. This warranty comparison should give you a feel for what you should expect when it comes to retreading.

Second: Talk with your tire dealer or retreader and ask about retreadability of the evaluation tires compared to your current tires. The retreader may give you actual rejection rates for the two brands (also known as RAR or “returned as received”). Also, ask them what they will pay for a virgin casing of each brand.

Your tire dealer may also be able to refer you to other fleets that are running the tires you are considering. You could ask them what they’re experiencing in retreadability. What you learn may sway your decision once your “original tread” cost-per-mile is determined.

Determining Cost-Per-Mile

You have your data, now you can crunch some numbers. The original tire cost-per-mile is a simple calculation. Take the purchase price of your evaluation tire and divide by your projected mileage. As an example, you may be paying \$400 for your evaluation drive tire and your projected mileage is 390,000 miles. So, divide your cost by the mileage and you come up with \$0.001026 per mile. If your current tire costs \$600, and it projected to deliver 10 percent more mileage or 429,000 miles, you’d be at \$0.001399 per mile. So, even if your evaluation tire didn’t outperform the incumbent tire in mileage, it did best it in cost-per-mile, and that’s the metric that’s most important.

Next, factor-in what you found on retreading. Here’s how to calculate retreads:
(Purchase price of new tire – virgin casing value)/(Tire mileage)

This sample calculation gives you the cost-per-mile of the tread rubber.

Tire	Original Tire Price	Casing Value	Tire Mileage	Cost per mile of tread
Tire A	\$400	\$90	390,000	0.000795
Tire B	\$600	\$130	429,000	0.001096

Take your purchase price and subtract the retread casing value, then divide the result by your mileage. For example, if you paid \$400 for the tire and had a virgin casing value of \$90, your net cost would be \$310. If you received 390,000 miles on that drive tire, your cost-per-mile of tread would be \$0.000795.

After the Evaluation:

If your evaluation tire outperformed the incumbent, as in our example above, do you make a wholesale change in up-fitting your equipment? Our recommendation is to move forward, but not all the way forward. If you have followed through properly, you have completed a very important evaluation, which now gives you confidence in the new tire and how it should outperform the incumbent. It won’t take long to see the proof on a

grander scale. So, begin to purchase 50 percent of the “new” tires for six months – both in replacement and through your truck OE if available—and then at a year, move forward on full-tire standardization.

It is my hope that this information has been helpful as you work to assess the various tire options you have available with an eye to reducing costs over the long term. While it takes time and effort to conduct your own testing, it can be done and is well worth it as you seek to gain a competitive edge for your fleet.