

Tire Costs Eating Your Profits?

By Mehrdad Farkhan

Achieve savings, improve performance and avoid downtime by checking tires as part of your vehicle maintenance program.

One of the best ways to keep your business running efficiently is to keep your trucks rolling. Tires represent approximately 20 percent of vehicle maintenance costs — they're one of the top three operations and maintenance (O&M) expenses, and the No. 1 cost item for refuse fleets. However, properly maintaining your tires can decrease overall expenditures while minimizing vehicle downtime. Annually, \$700 per truck can be saved if you remember these tips.

- Even with the best possible seal between beads and wheels, and no valve stem leaks, truck tires can lose as much as 3 pounds per square inch (psi) per month — even when the vehicle is parked.
- A truck tire can run 5 degrees hotter for every psi the tire is underinflated.
- A 10-psi underinflation can cause tires to wear out up to 20 percent faster than normal.
- A 10-psi underinflated tire can result in fuel consumption of up to 170 gallons more per year.

Underinflation's Effects

More than 260 million tires are scrapped every year in the United

States, according to a recent study from the Scrap Tire Industry Management Council of the Rubber Manufacturers Association (RMA), Washington, D.C. Many of these tires met an untimely end because of poor maintenance.

For example, underinflation causes several costly problems including irregular and uneven tire wear, which is the result of uneven tire abrasion. Using load and inflation charts will ensure that the cross sectional area of the tire that is in contact with the road remains consistent at various loads. At each load, when tire pressure is adjusted properly, the cross sectional shape of the tire, otherwise known as the footprint, should remain the same.

Pressures always should be set when tires are cold. Never set tire pressure by bleeding or adding air to a tire that has been driven more than one mile. Always set pressure on a vehicle that has been parked for three to four hours.

Typically, a tire rotates nearly 500 times per every mile traveled. On average, if a vehicle travels about 100,000 miles per year, each point on the tread of the tire comes in contact with the road nearly 50 million times. Ideally, the tire's footprint should remain consistent, and the wear should be uniform.

Underinflated tires significantly affect vehicle fuel economy. Underinflation of 10 psi can reduce your fuel economy by as

much as 1 percent. At an average of 100,000 miles per year, you would use an extra 168 gallons of diesel, or about \$170 per truck, on wasted fuel.

Proper pressure maintenance is even more important in dual assemblies. Matching pressures is critical because an inflation mismatch of as little as 5 psi can change the tire circumference. When two tires have different circumferences but are bolted together, they are forced to travel the same distance in a single revolution. This causes the larger tire to drag the smaller one, causing fast and irregular wear. A 5 psi difference in pressure can result in a $\frac{3}{16}$ -inch change in the tire's circumference. In 100,000 miles, the circumference difference would cause the small tire to be dragged 246 miles.

In addition, even when using tires from the same manufacturer with the same tread design, it is imperative that the tread depths be within $\frac{1}{8}$ inch.

Tire Temperature

Rubber, which is an excellent insulator and heat sink, will naturally build internal heat due to friction and the centrifugal force of the tire carrying loads. A properly inflated tire running at 65 mph will heat up to approximately 170 degrees. Most fleet managers and even their tire representatives don't realize that as little as 5 psi underinflation can cause tires to run up to 25 degrees hotter and that a 10-psi underinflated tire can wear out 10 percent to 20 percent faster. That's a loss of \$25 to \$50 per \$250 tire due to premature tire wear. Consequently,



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you'll change tires more frequently, pay more service fees and experience more downtime.

Underinflation also causes excessive flexing, which leads to premature fatigue and failure of the steel cords. Ultimately, this limits the number of potential retreads from each casing. And, if casings are worth \$65 to \$85, instead of getting a useful retread, you could lose that much, plus the additional \$4 to \$7 in disposal fees required by most states.

Porosity and Valve Leaks

To minimize air loss from mechanical sources, use metal valve caps to eliminate valve leaks and to keep contaminants and water out of the valve mechanism. A valve core is a mechanical device that must seal against high pressures. Dirt can prevent the valve from sealing properly, resulting in air loss. Water also can get into the mechanism, which, in cold climates, would freeze. If that water freezes, the expansion caused by the freezing water can crack the valve mechanism and cause valve failure. Thus, using quality metal valve caps are a cheap way to minimize underinflation and downtime.


Rubber on the Road

Tire debris on the road — gators — are caused by underinflation, overloading, mismatching of tires on dual wheel positions and other improper maintenance and inspection procedures. Although retreads are perceived to be responsible for tire debris, studies have found that most tire and scrap rubber debris is caused by underinflation and nail punctures.

Underinflation makes tires susceptible to cuts and flats, resulting in more emergency road service calls. The RMA and the Tire Maintenance Council (TMC) of The American Trucking Association, Alexandria, Va., recommends that a tire underinflated by 20 percent or more be removed from service and inspected. A tire that "runs flat" (20 percent underinflation), can lead to a sudden catastrophic or zipper failure.

Often, a tire that comes apart while driving causes failure in the tires. The debris from a disintegrating tire could puncture another tire, or cause other tires to carry a disproportionate load, which causes overheating and failure. What could have been a \$15 to \$20 nail hole repair ends up being a \$500 to \$1,000 expense, or even worse, may result in accidents and injuries. It's estimated that more than 250,000 accidents are caused by improper tire inflation.

Consider your tire maintenance program as an investment. If done weekly, it only takes about 30 minutes to check and adjust inflation pressures on an 18-wheeler. The returns however, will be better fuel economy, longer tread life, lower road service bills, improved retreadability and less downtime — not to mention a reduction in roadside tire debris would help the environment and improve the industry's overall image.

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