

## 1. PRESSURE DROP IN TIRES



The summer months of July and August can take a serious toll on your tires. Treadwear is more rapid because of the combination of higher ambient and higher road surface temperatures, and heat has always been a tire's worst enemy. Maintaining proper tire pressures is always important to maximize treadwear, fuel economy, and retreadability. In the summer time, it is even more critical. Keeping the tire running "cool" is the key to success.

Rubber on the road, more commonly called "road alligators," increase dramatically on the nation's highways during the summer driving season. The majority of the motoring public clearly believes that these road alligators are caused by bad retreads; this is just not accurate. The alligators on the road could be new tires or, maybe, retreads. If either a new tire or retread is running underinflated based on the vehicle load and speed for an extended period of time, that tire can fail with the result a road alligator.

Air is what carries the load in a tire. The tire manufacturers all publish a load-inflation table that lists the maximum load/tire for a given pressure. A tire with little or no air is eventually going to fail. Those inside dual trailer tires (new tires or retreads), which are the least maintained tire on the vehicle when it comes to maintaining proper tire pressure, are often the biggest culprit based on historical industry studies of rubber on the road analysis. These same industry studies have clearly shown that 90% of the rubber on the road is and continues to be tires run underinflated. There are really only three [reasons why a tire loses air](#):

- Osmosis;
- Tread area punctures;
- and Valve stem and valve core leaks.

Just like a balloon, a tire will lose air by osmosis through its casing. Depending on the tire make/model, commercial tires will lose 1–2 PSI per in July; doesn't sound like very much. Over a year, that will add up to be as high as 24 PSI. Running a commercial truck tire with a target pressure of 100 PSI 24% underinflated on a fully loaded vehicle at 65 MPH or faster in the middle of Texas in August is not a good combination.

Industry tire pressure surveys suggest the poorest air pressure maintenance practices occur on trailer tires as the poorest. Inside dual trailer tires usually have the lowest measured tire pressures. Inside dual trailer tires at 70 PSI and outside duals at 100 PSI is not uncommon. This leads to significant amount of irregular wear and early tire removals because of the difference in tire revolution per mile of the two tires running at the different operating pressures.

Depending on the specific tread area puncture, in addition to losing 1-2 PSI in July due to osmosis, a slow leaking puncture, which penetrated the groove of a tire, may lose 3-4 PSI or more per day. Within a week, you can have a big issue. Punctures in the tread area are the number one reason why tires lose air. The old number 20 penny nail is the main culprit when it comes to punctures.

[Valve cores have been known to stick](#), which can cause loss of air. Over tightening valve cores is also a known problem. Torquing a valve core more than the recommended 4 in.-lbs. can also result in loss of tire air pressure.

Fleets need to develop a serious tire pressure maintenance program as part of their overall tire program. Inspecting and checking pressures on a regular basis is very important. Drivers are the early warning system when it comes to monitoring tire pressure. During the driver vehicle walk-around, tires need to be visually inspected and checked with a calibrated air pressure gauge. Using a “club” is not sufficient to identify an underinflated tire. Tire pressure monitoring systems and automatic tire Inflation systems continue to increase in popularity.

Emergency tire roadside service calls drop dramatically when tires are properly inflated, so it is always a good idea to work with your tire professional to develop a solid tire and tire pressure program for your fleet.

## 2. REASONS FOR PRESSURE DROPS.



An effective tire policy must address the four key elements that contribute to the extended life of any tire: air pressure; rotation; mechanical maintenance of the vehicle; and speed. While maintaining the proper overall maintenance of steer and drive tires is relatively simple and achievable, the overall maintenance of a trailer tire is the most challenging since trailers are frequently rotated or released in a route or during delivery change. Their maintenance level is one the poorest all equipment considered: tractors, dollies, trailers, etc.

### 1. Air pressure

For every 10% of [tire under-inflation on a vehicle](#), a 1% reduction in fuel economy will occur which, although this small in amount is actually big when you multiply it by tire positions, number of trucks in a fleet and miles run per year. By running a tire constantly underinflated by 20%, its tread life will be reduced by 30%, while 40% under-inflation will reduce the tire life by 50%; not to mention factors like: Irregular wear; higher thermal; mechanical fatigue of the casing; lower retreadability; and premature failure.

### 2. Rotation

The periodical rotation of tires will not only prevent or reduce the inevitable irregular wear (camber, river wear, toe-in the front axle; heel and toe, step-down in the drive axle), but also will extend the life of the tires and will contribute to smoother, more fuel efficient performance. Vehicle alignment: This is one of the top contributors to fast wear, irregular wear and fuel economy in all the tires on the vehicle and is associated with other physical effects like the entire aerodynamics of the trailer with subsequent additional impact in fuel economy (2% or more).

### **3. Speed**

Because rolling resistance increases with speed, for every mile per hour (MPH) increase in speed above 55 MPH, there will be a 2% reduction in miles per gallon. Therefore, a change from 55 to 65 MPH will result in a 22% increase in fuel consumption while reducing only 18 % the travel time. High speeds cause higher thermal and mechanical fatigue of the casing, lower retreadability and potential premature failure.

### **4. Maintenance is key**

Having a well-synchronized air pressure maintenance program between drivers and your shop should be the single most important element of your tire policy and is the easiest to administer. It has the biggest impact on fleet costs associated with tires, including: fuel consumption, wear life, irregular wear, etc.

### 3. WHY DO TIRES LOSE AIR.

Maintaining proper tire inflation pressure is a goal for every fleet manager. When the proper air pressure is correctly set, tire removal miles, fuel economy and retreadability all are maximized. Air carries and supports vehicle loads; in a perfect world, depending on the specific load, the inflation pressure should be set accordingly.

If a loaded tire is carrying 6,000 lbs. when run on the steer position, then the recommended tire inflation is 110 PSI for the common 295/75R22.5 low profile tire size. Load-inflation tables state the designed tire pressure defined for given tire loads. These tables are readily available on all the tire companies' websites. However, be careful when reading these charts, since the recommended pressures vary depending on tires being run as singles or as duals.

Since it is totally impractical to change tire pressures every time the trailer load changes, the recommended tire pressure setting must be based on the worst case load scenario. Even though the average load may be significantly lower than the worst case load, it still is very important to set the pressure based on that worst case load scenario.

Fleet tire managers typically ask how frequently they should be checking tire pressures—and why tires lose so much air during the course of the year. There really are only four reasons why tires lose air:

1. Osmosis of air through the tire casing can lead to a loss of 1 to 3 PSI per month, depending on the specific tire make and model. The type of compounds used in the manufacture of the tire can have a big impact on osmosis. The composition and gauge of the tire innerliner compound also plays a significant role in osmosis. Losing 2 PSI per month does not sound like very much, but after 12 months the tire would be considered “flat” and should be removed from service. If a tire is measured to be 20% under the fleet's specification, the industry recommendation is to remove the tire from service, dismount and determine exactly what is going on with the tire.

2. Slow leaking punctures in the tread are the leading cause of tires losing air. A nail embedded in a tire's groove may cause a loss of 2 or 3 PSI per day, not 2 or 3 PSI per month as with osmosis. You can check the tire pressure before the vehicle leaves the yard in the morning, yet pick up a nail just a few minutes later.

3. Leaking valve stems and cores are another cause of low tire pressure. Over-tightening valve cores can lead to loss of air. There actually is a specification of 4 in.-lbs. of torque on a tire valve core. Valve core pre-set torque wrenches are available through tire supply companies.

4. Finally, tires lose air through impact breaks. Running over large objects and hitting the curbs on those right-handed turns can lead to air loss, which is usually sudden and will lead to an emergency roadside service call.

So, how frequently should a fleet be checking tire pressures? It depends on the type of service vocation. If vehicles see a high volume of mixed service and are on unpaved roads, then tires need to be checked a lot more frequently than tires running on vehicles that are going coast-to-coast over the interstates.

If the vehicles are coming back home every night and travel on good roads, then a once a week check of tire pressures is the standard recommendation. However, it always is a good practice to check tire pressures as often as is practical.

Having said that, it is fair to note that the drawback with checking tire pressures frequently is that it just takes time. Checking the pressure of 18 tires with valve caps on one rig can take up to 15 minutes to complete.

Finally word of advice—always use a pressure gauge that has been calibrated. Some stick gauges are adjustable by turning a screw located in the bottom of the gauge. Many truck stops have air inflation calibration stations to check your pressure gauges. Even brand new pressure gauges out of the box are only accurate to +/- 3 PSI, so it is a good idea to check your gauges for accuracy on a regular basis.