



## Proper Inflation

### SAFETY WARNING:

Serious injury may result from tire underinflation/overloading. Follow Owner's Manual and tire placard in vehicle.

### MAINTAIN PROPER INFLATION PRESSURE IN YOUR TIRES.

Proper inflation pressure is necessary for optimum tire performance, safety and best fuel economy. To maintain proper inflation pressure, frequently check tires (when they are cool) with an accurate tire pressure gauge. For example, it is difficult to tell just by looking at radial tires whether they are under inflated.

- Evidence of air loss or repeated under inflation requires tire removal and expert inspection.

Always maintain inflation pressure at the level recommended by the vehicle manufacturer as shown on the vehicle placard or in the Owner's Manual. Higher inflation pressure increases stiffness which may deteriorate ride and generate unwanted vibration.

Tire footprint and traction are reduced when van, pickup or RV tires are over inflated for the loads carried. In particular, tires with aggressive tread patterns may contribute to oversteer or "roadwalk" if inflated beyond the inflation pressure specified in the Owner's Manual and vehicle placard for standard or customary loads. Over inflation also increases the chances of bruise damage.

Under inflation is the most common cause of failures in any kind of tire and may result in severe cracking, component separation or "blowout," with unexpected loss of vehicle control and accident. Under inflation increases sidewall flexing and rolling resistance resulting in heat and mechanical damage.

Furthermore, when operating a vehicle equipped with radial tires, it is difficult to notice when a tire has gone flat or near flat since the "feel" of the vehicle does not change significantly.

[http://www.dunloptires.com/care/proper\\_inflation.html](http://www.dunloptires.com/care/proper_inflation.html)

A tire is a pneumatic system, which supports a vehicle's load. It does this by using a compressed gas (usually air) inside to create tension in the carcass plies. It is important to realize that a tire carcass has a high-tension strength, but has little or no compression strength. It is the air pressure that creates tension in the carcass and allows the tire to function as a load-carrying device. That's why inflation is so important. In an inflated, but unloaded tire, the cords pull equally on the bead wire all around the tire. When a tire is loaded, the tension in the cords between the rim and the ground is balanced or relieved. The tension in other cords is not changed. Therefore, the cords opposite the ground pull upwards on the bead. This is the mechanism that transmits the pressure from the ground to the rim.

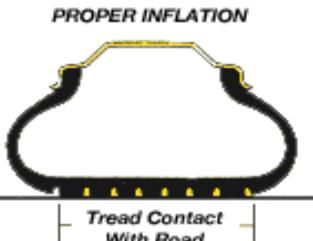
In addition, a tire must transmit handling (acceleration, braking, cornering) to the road. Cornering forces are transmitted to the rim in a similar manner to load. Acceleration and braking forces rely on the friction between the rim and the bead. Inflation pressure also supplies the clamping force, which creates friction.

A tire also acts as a spring between the rim and the road. This spring characteristic is very important to the vehicle's ride.

Too high an inflation pressure causes the tire to transmit shock loads to the suspension and reduces a tire's ability to withstand road impacts.

Too low an inflation pressure reduces a tire's ability to support the vehicle's load and transmit cornering, braking and acceleration forces.

Finding the optimum inflation pressure requires extensive engineering efforts on the part of tire and vehicle manufacturers.



**PROPER INFLATION**

The correct profile for full contact with the road which results in minimum tire performance is shown above. Because radial ply tires have a characteristic bulge in the sidewall even when properly inflated, it is impossible to visually determine the degree of inflation. Use a reliable air guige to check the inflation pressure.



**UNDER INFLATION**

Underinflation causes tire deflection and heat buildup, which increases the risk of failure, it also causes excessive wear on outer tread ribs.

Under-inflation can cause many tire-related problems. Because a tire's load capacity is largely determined by its inflation pressure, under-inflation results in an overloaded tire. An under-inflated tire operates at high deflection, resulting in decreased fuel economy, sluggish handling and may result in excessive mechanical flexing and heat buildup leading to catastrophic tire failure.

Correct inflation is especially significant to the endurance and performance of radial performance tires. For example, because of a performance radial's aspect ratio and design, it may not be possible to look at a radial tire and actually see under-inflation of 5 psi. However, under-inflation of 5 psi can reduce a performance tire's tread life by 25%. A typical tire may also lose 1 to 2 psi a month, if not checked and adjusted.

Temperature Effects: Air pressure is affected by temperature. The air under pressure in a tire is no exception. Typically, an inflation pressure can change by 1 psi for every 10 degrees Fahrenheit of temperature change. Higher temperature means increased pressure.

For example, if a tire is inflated to 35 psi on an 80-degree July day, it could have an inflation pressure of 23 psi on a 20-degree day 6 months later in January. This represents a normal loss of 6 psi over the six months and an additional loss of 6 psi due to the 60-degree temperature change. At 23 psi, this tire is severely under-inflated.

**SAFETY Note:** For safety and vehicle performance, Dunlop recommends that tire inflation pressure be checked at least once each week and as often as possible when tires are cold (ambient air temperature and if the vehicle has not been driven for several hours.) Repeat or excessive inflation loss (more than 2 psi); visible damage such as knots, bulges, punctures, cuts, cracks, irregular wear; experiencing impacts, vibration or pulling; all require removal, expert inspection of tire and rim to determine reparability, or the need for replacement. Damaged tires may fail suddenly or burst upon re-inflation, resulting in serious injury