

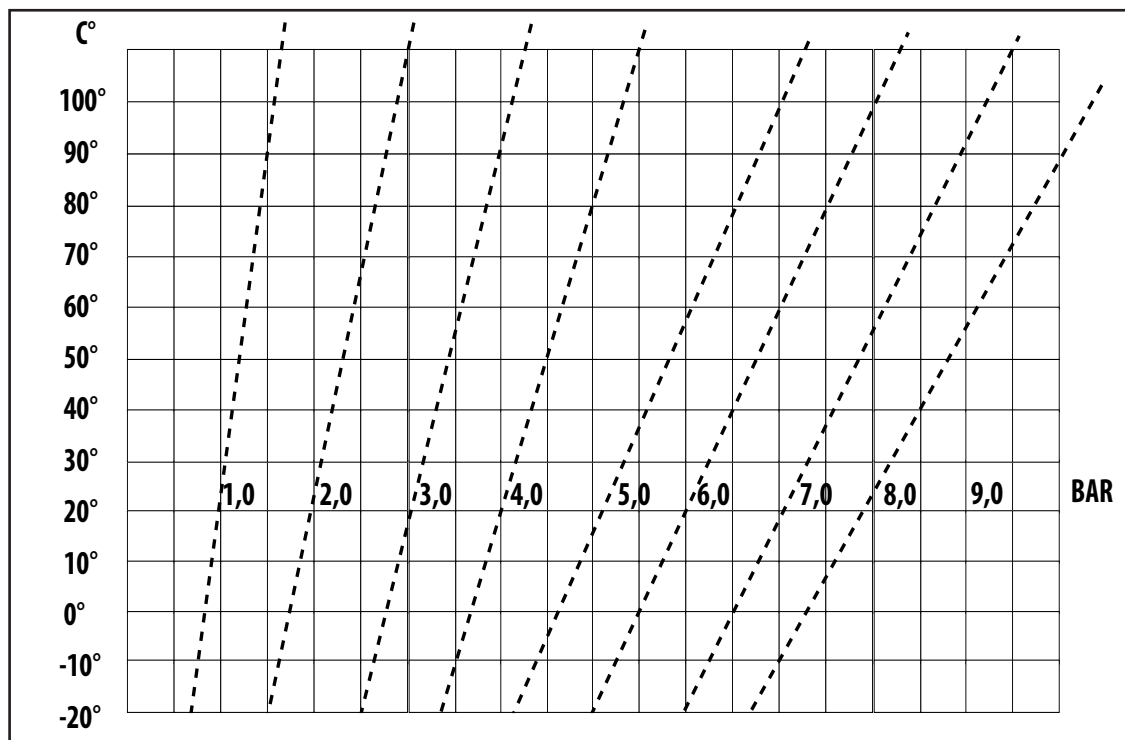
5.0.0 INFLATION

5.1.0 INFLATION PRESSURE

- The stated load capacity and speed code only apply if the tyres are inflated to the correct pressure
- It is therefore essential to comply with the tyre inflation instructions provided by the manufacturer, and adjust the pressures as appropriate to the loads on the axles
- Over/under inflation is therefore not the only cause of uneven tread wear, but it may help to trigger premature tyre damage
- Tyre pressures, once the wheel is in operation, should be checked cold at least every 2 weeks, and preferably before every long trip.

- After stopping, tyres take 2-3 hours to cool to ambient temperature. Never deflate hot tyres.
- The recommended tyre pressures for the vehicle/axle must be indicated by special stickers applied to the relative mudguards.
- If large pressure variations (+/-15% or more) occur on just one tyre, the causes of the problem must be identified as soon as possible.
- Pressure gauges must be checked regularly using a standard pressure gauge, and re-adjusted if necessary.
- An increase in pressure between “cold” and “hot” states of 25-30% means that the tyre is being subjected to serious fatigue because of under-inflation; separation may therefore be imminent (a 30% increase in pressure corresponds to a tyre temperature of about 100°C)
- Try to prevent rim corrosion and if possible do not allow moisture to enter the tyre; compressor tanks should be dried out regularly
- It may be the case that uneven tread wear does not improve when the inflation pressure is changed; increasing or reducing the pressure might be important with regard to other tyre performance factors, but not necessarily wear

5.2.0 AIR PRESSURE IN RELATION TO TEMPERATURE AT CONSTANT VOLUME



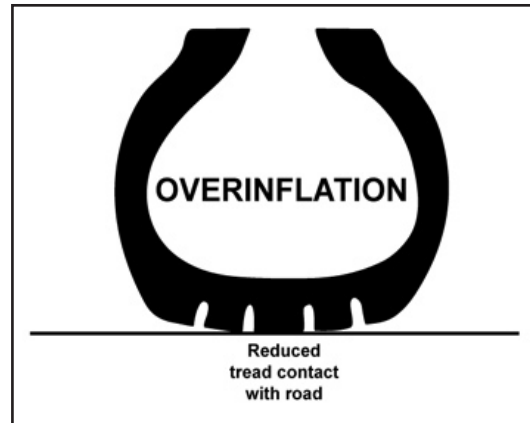
Example: A pressure of 8.0 bar at 20° rises to 10.5 bar when the temperature increases to 100° and drops to 6.8 bar at a temperature of -20°.

5.3.0 OVER OR UNDERINFLATION

OVERINFLATION OR INSUFFICIENT LOAD (POOR FLEXING)

Consequences

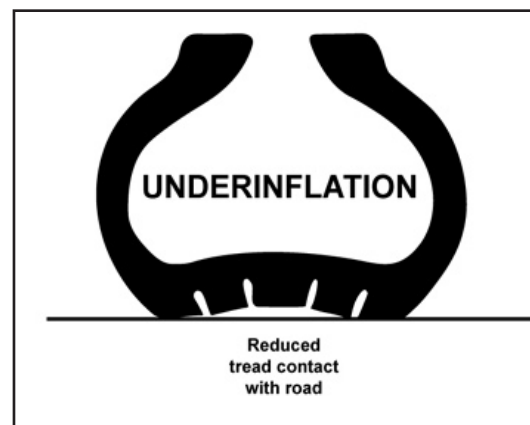
- Rapid wear of the central strip of the tread
- Poor resistance to knocks, penetration and breakage
- Sawtooth wear (especially in block tread patterns)
- Poorer handling
- Increased damage to the vehicle (wear of suspension components, failure of welded parts, leaf spring failure, etc.)
- High risk of damage to the load
- Poor vehicle handling, especially the rear axle



UNDERINFLATION OR OVERLOAD (EXCESSIVE FLEXING)

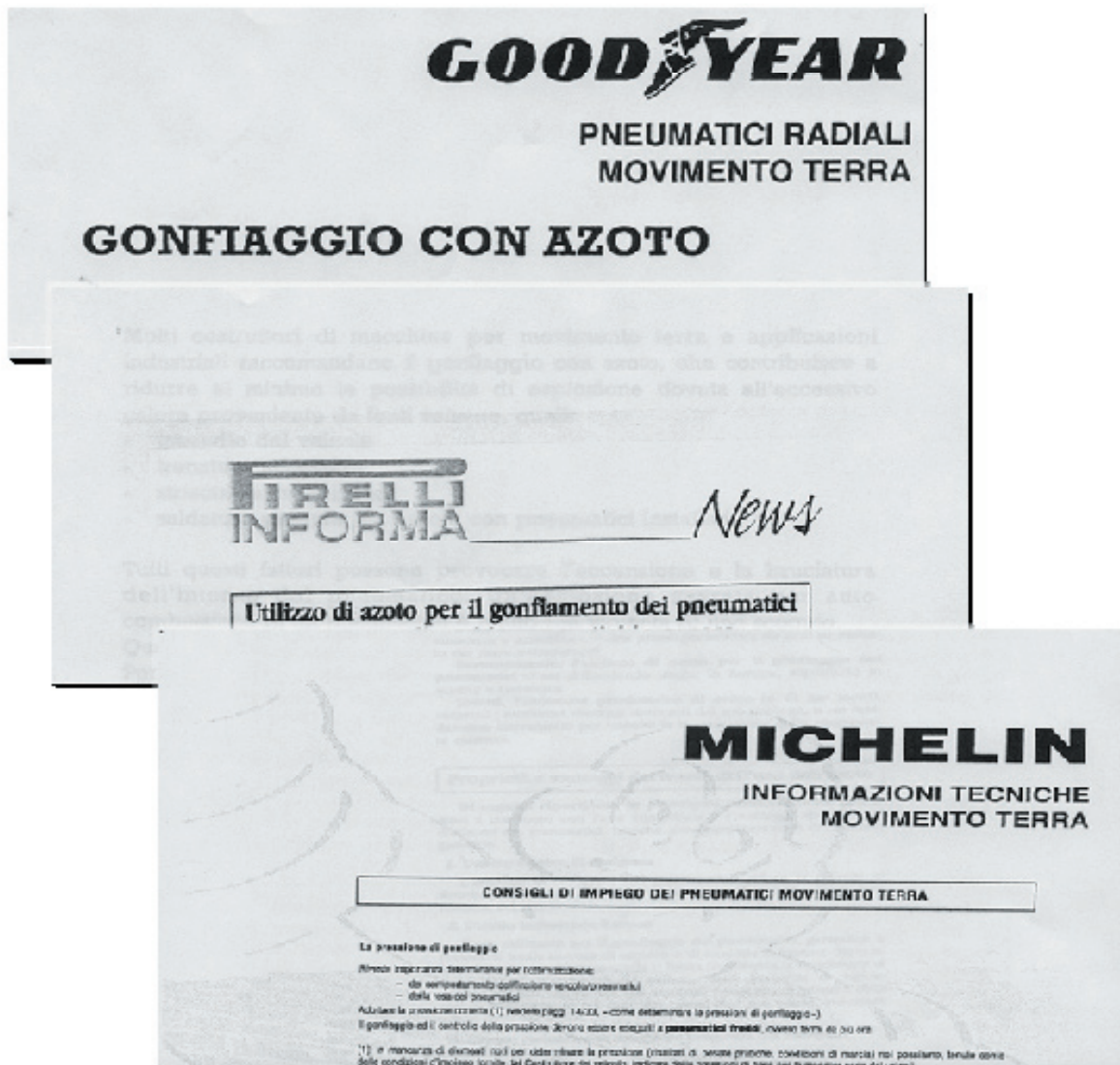
Consequences

- Uneven and rapid wear of tyre shoulder
- Risk of compound lamination (due to heat) leading to separation
- Separation in bead area (ends of plies and/or reinforcements)
- High degree of rubbing in rim zone
- Poor vehicle handling – veering, slow steering response, increased lateral oscillation



5.4.0 NITROGEN INFLATION

- 1) More time between tyre inflating (saved \$) The length of time between recommended tyre checks triple with the use of nitrogen.
- 2) Condensation inside the tyre decreases (saved \$) With more oxygen in your tires, condensation occurs, which ages the tires, and rust forms more easily on the rims. Nitrogen considerably slows this process.
- 3) Lessens the chance of a tyre explosion (saved lives) Nitrogen doesn't heat up the way oxygen does. This prevents tyre over-heating and eventual explosions (saved lives)
- 4) Consistent pressure inside the wheels (saved lives). With oxygen in your tires, oxidation occurs, and the pressure in your tyres changes, worsening driving conditions. With nitrogen, the pressure remains the same.
- 5) Most important tires manufacturers recommended use of nitrogen inside all type of wheel.



GOODYEAR

Radial tyres - Earth-moving vehicles - Inflation using nitrogen Many manufacturers of vehicles for earth-moving and industrial applications recommend inflating tyres with nitrogen, which contributes to reducing the risk of explosions By refusing to inflate tyres using nitrogen when nitrogen is advised by the vehicle's manufacturer, you accept to free Goodyear Tyre & Rubber Company and its relative agents and employees from all responsibility for personal injury, death or damage to property due to inflating tyres with air instead of nitrogen. ...

PIRELLI

Pirelli Report News

Use of nitrogen for inflating car tyres and tyres in general ...Properties and advantages in the use of nitrogen

In the following points, we have outlined the main characteristics of nitrogen compared with compressed air and the specific advantages for tyres, as well as some other more general considerations.

MICHELIN

ADVICE FOR BETTER UTILISATION OF TYRES... INFLATION USING NITROGEN

Air contains oxygen and nitrogen. Oxygen spreads through the tyre much more quickly than nitrogen. A tyre that has been inflated with nitrogen loses pressure 3 times less quickly than a tyre inflated with air. The tyre inflated with this system is therefore subject to less frequent checks and is also less likely to suffer the negative consequences of under-inflation. The use of nitrogen to inflate tyres reduces the oxidisation of the rubber and the corresponding gradual deterioration of the tyre. Nitrogen also reduces the rim's components corrosion and the resulting dismantling problems



BUTLER NITROWER FOR TRUCK WHEEL INFLATING WITH NITROGEN.

5.5.0 TYRE EXPLOSION

Any motor vehicle tyre, when inflated to recommended pressures, represents a tremendous amount of potential energy. If improperly treated, a tyre can literally explode, suddenly releasing this stored-up energy with sometimes-disastrous results.

Explosions occur infrequently, but have occurred for the following reasons:

1. Flammable vapours pumped into a tyre can explode from static electricity. Flammable vapours may inadvertently be pumped into a tire along with the air from the compressor when the tire is inflated. These vapours can originate from several sources.
 - Using alcohol, methanol, dry gas, or any other flammable material in the compressor tanks to prevent freezing on condensation.
 - Storing flammable solvents or rubber cements near the air in take of the compressor.
 - Cleaning of the air screen on the compressor in take with flammable solvents such as gasoline or varsol.
 - Locating a battery charger near the air compressor in take can result in hydrogen gasses being drawn into the compressor.
2. Tyre defects.
3. Excessive tyre spinning as on snow, ice or mud and sand, can cause a tyre to tear apart and explode (some vehicles are able to bring a tyre to its centrifugal force failing point in 3 to 5 seconds).
4. Defective or damaged rims can fly apart during bead seating.
5. Extreme over inflation.
6. Improper mounting/demounting/bead breaking.

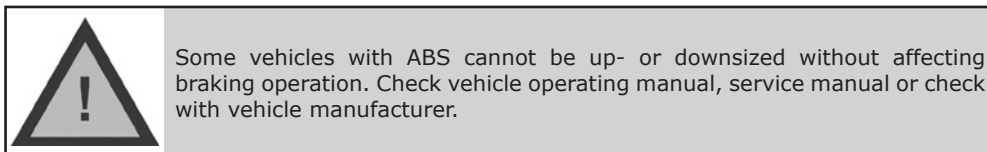


FOR YOUR SAFETY DURING THE INFLATION OF THE TRUCK WHEEL (AND IN SOME COUNTRY BY LAW), BUTLER RECCOMENDED USE OF HIS SAFETY CAGE.

5.6.0 INSTALLING THE TYRE/WHEEL ASSEMBLY ON THE VEHICLE.

When installing the tyre and wheel assembly on a vehicle, verify that it will clear the vehicle's fender, moulding, callipers, springs and struts in full left and right turns. If the tyre and wheel have been up-sized for a vehicle that has an anti-lock brake system (ABS) also verify that the assembly will not interfere with the ABS.

Vehicle manufacturers have indicated that a change in a tyre/wheel diameter or axle ratio less than 15 percent will not normally affect the performance of the ABS. Changes in tyre/wheel diameter or axle ratio that are greater than 15 percent will affect the performance of the ABS and require recalibrating. Instructions for recalibration of the system to maintain speedometer accuracy and ABS performance are included in most vehicle service manuals



To avoid wheel distortion and to maintain a concentric assembly, snug the lug nuts gradually at first and tighten to the recommended torque setting using the criss-cross tightening sequence. The vehicle manufacturer sets lug nut torque specifications.

Excessive torque on the lug nuts can damage studs, distort wheel spiders or warp brake rotors on cars equipped with disc brakes. A warped brake rotor can cause high-speed vibration, or result in pulsating brake pedal action and reduced braking efficiency. It is recommended that lug nuts, on cars equipped with disc brakes, be tightened to exact specifications with a torque wrench.