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## Tire Inflation: Multipurpose Passenger Vehicles

This bulletin supersedes all prior Toyo publications related to tire inflation for multipurpose passenger vehicles, including **recreational vehicles**. The purpose of this bulletin is to disseminate Toyo's recommendation and policy regarding inflation and tire maintenance of original equipment tires, and direct replacement tires (same size and load range) on multipurpose passenger vehicles.

For the purpose of this bulletin multipurpose passenger vehicles include all vehicles equipped with LT designated tires, or medium duty truck tires. Multipurpose passenger vehicles include **recreational vehicles (including class A, C, and B RVs), busses, and EMS (emergency medical service) vehicles.**

### Inflation of Original Equipment Tires on Multipurpose Passenger Vehicles:

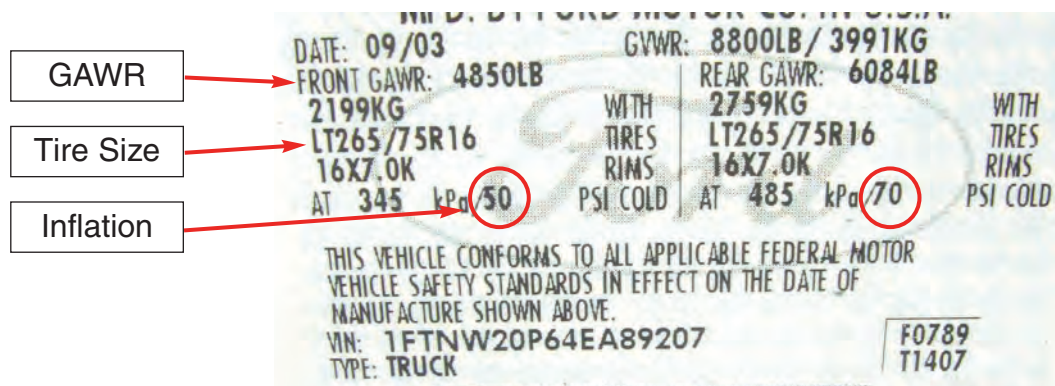
**Toyo's policy is to maintain the pressure specified on the vehicle's tire information placard (certification label) as established by the vehicle manufacturer or final stage manufacturer.**

Replacement tires must also be capable of supporting no less than the vehicle's GAWR (per axle).

### Tire Inflation and GAWR Information:

The vehicle's tire information placard (certification label) includes information regarding the tire size, inflation, GAWR and other information. The tire information placard is usually located on the driver's door hinge pillar, door latch post, or the door edge. In RVs the tire information placard is placed on the bulkhead at the left of the driver's seating position.

### Example – Tire Information Placard (Certification label):



## Applicable Federal Motor Vehicle Safety Standards:

Federal Motor Vehicle Safety standard (FMVSS 571.120) requires the following of vehicle manufacturers in applying original tires to vehicles:

***The sum of the maximum load ratings of the tires fitted to an axle shall not be less than the gross axle weight rating (GAWR) of the axle system as specified on the vehicle's certification label (tire information placard).***

Consequently, vehicle manufacturers are required by federal regulations to apply tires of a sufficient size, load range, and load capacity (by inflation) to support no less than the GAWR.

## GAWR Definition:

The maximum allowable weight the axle assembly is designed to support as determined by the vehicle manufacturer. This includes both the weight of the axle and the portion of the vehicles weight carried by the axle.

## GVWR Definition:

The Maximum permissible weight of the vehicle, including the unloaded vehicle weight plus all fluids, cargo, passengers, optional equipment and accessories. For safety and product performance, **do not exceed the GVWR.**

## Checking Loaded Axle Weights & Load Distribution:

Consumers should make themselves aware of the loaded weight on each axle and wheel position of their vehicle and achieve as equal distribution of side-to-side weight as possible by redistributing cargo or payload as required. This can be determined by weighing each wheel position of the vehicle on a public scale. In any case where vehicle axle loads exceed the loads stated on the vehicle placard, all attempts should be made to reduce the vehicle's weight prior to driving. **A vehicle must never be operated when the loaded weight of any axle exceeds the GAWR, nor should any vehicle be operated when the actual loaded weight exceeds the gross vehicle weight rating (GVWR).**

## Tire Inspection & Tire Rotation:

The practice of rotating tires on multi-purpose vehicles should take into consideration any past under-inflation of tires. **Any tire that has been run under-inflated for any length of time may have become dangerously fatigued (damaged internally), and subject to sudden failure.** The term 'under-inflation' may be defined as the operation of any tire below an inflation level required to support the tire's actual load (according to tire load & inflation charts). Toyo recommends that any tire that was known, or suspected of being run under-inflated or overloaded should be dismantled and fully inspected by a qualified tire professional for any damage or indications of fatigue before being rotated or returned to service.

### **Tire Damage and Aging (non-commercial use):**

Vehicle operating conditions and tire maintenance practices vary widely. Tires should be routinely checked for damage or signs of fatigue or aging. This should be done at scheduled vehicle maintenance intervals and preferably on a lift so that the tires can be thoroughly inspected by a tire professional.

### **Reducing Inflation pressure – Vehicle Certification Label:**

**Under no circumstances should the tire inflation pressure be reduced below that stated on the vehicle's tire information (certification) placard to achieve improvements in ride comfort.** If you do not know where the tire information placard is, contact your vehicle manufacturer for its location and tire inflation recommendation. For RVs, the certification label is usually placed on the wall or bulkhead to the left of the driver's position.

### **Air Compressor Capacity:**

For vehicles equipped with air compressors. Some compressors may not be capable of inflating the tire to the required inflation pressure. In this case, consumers should take their vehicle to retail tire shop or commercial vehicle repair shop with a higher capacity air compressor.

### **Check Cold Tire Inflation Pressure Prior to Driving:**

The cold tire inflation pressures of each wheel should be checked at least once per week and any corrections in cold tire inflation pressure should be made prior to a trip. "Cold" means that the tires are at the same temperature as the surrounding air, such as when the vehicle has been parked overnight. Never bleed air from a tire that has been run. It is normal for a tire's inflation pressure to increase (hot inflation pressure) after running (for example 30 minutes or more driving time).

### **Tire Air Pressure Loss:**

All tires lose air at the rate of 1 – 1.5 PSI per month due to natural permeation of the air through the tire's rubber membrane. Always check the cold inflation pressure of any vehicle that has not been driven for several weeks and re-inflate the tires to the placard pressure before driving.

Tire pressure is affected by the ambient temperature to the extent of approximately 1 PSI per 10 degree (F) change in temperature. As an example, a 20 deg. (F) drop in temperature will result in a 2 PSI drop. A 20 deg. (F) increase in ambient temperature will result in a 2 PSI increase. As ambient temperatures drop, tire pressures should be checked and the air pressures increased as required.

Aside from tire pressure fluctuations due to ambient temperature, any unexplained air loss, such as 1 PSI or more per week should be investigated for the cause(s), such as a nail puncture, leaking valve stem, etc., and corrected prior to driving.

## Driving Speed – Tire Fatigue:

Tires designated as ‘LT’ tires, and medium duty truck tires have less resistance to heat build-up compared to passenger tires, and are more susceptible to internal damage and fatigue if they are run under-inflated, overloaded, or in excess of their (rated) speed capability. **Driving at sustained high speeds with under-inflated and/or overloaded tires may lead to immediate tire failure.** Driving in excess of the tire’s speed capability – even if properly inflated – may result in sudden tire failure. **Consult the tire manufacturer regarding the speed limitation of the size and type tire you are using.** It is the driver’s responsibility not to exceed posted speed limits.

## FAQ for Tire Inflation on Multipurpose Vehicles:

**Q:** If my tire and axle loads are below the vehicle’s GAWR, can Toyo recommend a more suitable air pressure than that shown on the vehicle’s tire information placard?

**A:** No. The vehicle’s placard pressure will provide some measure of air pressure “reserve” over that required for the actual load, thus providing a **safety margin**.

**Q:** What if the vehicle’s certification placard inflation pressure is too high or low?

**A:** The vehicle’s certification placard inflation is not determined at the whim of the vehicle manufacturer. It is established in accordance with Federal Motor Vehicle Safety Standards (FMVSS 571.120) that require the tire size, load range and load capacity (by inflation) shall provide load capacity not less than the vehicle’s gross axle weight rating (GAWR). Although vehicle manufacturers must comply with this regulation, some originally installed tires may require higher or lower placard pressures depending on the size, load range, and load capacity of the tire.

**Q:** What are the consequences of inflating the tires to accommodate the actual loads?

**A:** If the inflation pressure corresponds to the actual tire load according to the tire manufacturer’s load and pressure table, the tire will be running at 100% of its rated load at that pressure. **This practice may not provide sufficient safety margin.** Any air pressure loss below the minimum required to carry the load can result in eventual tire failure.

Toyo Tire’s Unbiased

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