

I put on larger tires, now what?

Off-Road

Open any four wheel drive enthusiast magazine or visit any off-roading website and you will find all different kinds of advice for lowering tire pressures to maximize traction or floatation or comfort. There are numerous variables to consider including weight of the vehicle, size and construction of the tires, speed, terrain, and whether you have regular or beadlock wheels.

You can find tables that show a minimum safe tire pressure by vehicle weight and tire size for low speed travel. There is the "75% Rule" that says to air down until the distance between the wheel rim and the ground is 75 percent of what it was at highway pressure. One old-timer told me to just load the vehicle weight on a tire by driving one tire onto a big rock, then air down the tire on the opposite corner (it has the most vehicle weight transferred to it) until it looks too scary. Then drop the pressure in the other tires to match.

You may need more pressure in your tires than your buddy is running because you have thinner two-ply sidewalls that you don't want to over-expose to the sharp edges of fractured granite. You may air down those tires more to float over sand dunes while your buddy is stuck because his heavy three-ply sidewall mud tires won't flex enough to keep him on top.

Highway

Most of us put more than 90 percent of the miles on our rigs driving down the highway. Tires with correct air pressures are a critical safety item in this high-speed environment. Tires need to maintain full tread width contact with the road during acceleration, stopping, and turning on dry, wet, and snow-covered surfaces. High air pressure can force the tread to crown so there is less of the tread width maintaining contact with the road. Low air pressure not only wastes fuel through increased rolling resistance, it creates tire-damaging heat from excessive flexing of the tire carcass. Most of the shredded tires you see along the interstate are a result of low air pressure in a tire.

I'm guessing you upgraded your stock tires and probably went to a larger size since you are an off-highway enthusiast. If you're like me, you found it hard to find a reliable source of information about what tire pressure to use. Most sources default to filling the tires and letting out a little at a time until a chalk line drawn across the tread wears off evenly. That works, but there's gotta be something better, right?

I finally found a good Load Inflation Table by Toyo Tires® that does a real good job of explaining why and how recommended tire pressure changes with changes in tire size and type. You can find it here:

<http://toyotires.com/tire-care-safety/load-inflation-tables>

I won't guarantee that the numbers in the tables will be the same for all manufacturers, but I did quite a bit of spot checking with other manufacturers. They all had the same load rating for a given pressure in the same tire sizes. Here are some examples of how useful this information can be.

Example 1: My 2008 Chevy Colorado came from the factory with P235/75 R15 tires. The sticker on the door recommends front and rear should be inflated to 32 psi. According to the load inflation table, this size tire at this air pressure is rated at 1940 pounds. According to the load inflation tables, P-metric tires used on trucks have their load capacity reduced by 1.10 because they may experience more severe loading and use on trucks than on passenger cars. In other words, my P235/75 R15 tire is really only good for 1764 pounds (see "a" below) in a truck application.

a: $(1940/1.1 = 1764)$

Since I do a lot of driving on gravel mountain roads, I traded for light truck tires to improve puncture resistance particularly in the sidewalls. LT235/75 R15 tires at 40 psi are rated at 1680 pounds load capacity and at 45 psi are rated at 1825 pounds – a difference of 145 pounds of load capacity by changing tire pressure by 5 psi. 145 pounds divided by 5 psi equals 29 pounds of capacity per 1 psi. To make sure the load capacity of the LT tires match the 1764 pound capacity of the P-metric tires as specified by the truck manufacturer, the tires should be inflated to 43 psi (see "b" below").

b: $(1764 - 1680 = 84$ pounds difference between the LT tire capacity at 40 psi and the stock P tire load rating for the truck. $84/29$ pounds of capacity per psi = 3 psi. $40 + 3 = 43$ psi).

Example 2: Same 2008 Chevy Colorado pickup. When it was time to replace the tires, I chose to go with 31x10.50R15LT tires because – let's face it – 235s look stupid on Colorados. The 31s have a load capacity of 1765 pounds at 35 psi, which almost exactly matches the 1764 pound load capacity of the factory tires. That was easy!

Example 3: My 1992 Jeep Wrangler came from the factory with P205/75 R15 tires. The sticker on the door recommends 28 psi front and 32 psi rear. According to the load inflation table, the tires at those inflation pressures were rated at 1440 front and 1532 rear, which because of the 1.1 safety factor translates to 1309 front and 1393 rear in an LT tire. After over 15 years of

incremental changes, I now have 33x12.50R15LT tires on the Jeep. These tires have load capacity ratings of 1765 pounds at 25 psi and 2000 pounds at 30 psi. Calculating the load capacity per psi as explained above, the load capacity changes 47 pounds per 1 psi. To match the 1309 pound capacity of the factory tires in front, the tires should be inflated to 16 psi (see “c” below). To match the 1393 pound capacity of the factory tires in the rear, the tires should be inflated to 18 psi.

c: (1765 – 1309 = 456 pounds. 456/47 = 9 psi. 25 psi – 9 psi = 16 psi).

Last year, well before I found this Load Inflation Table, I did the chalk test on the 33s with my Jeep loaded normally. The chalk test showed 18 psi front and rear produced the most even wear. I love it when two independent methods yield such close results!

To summarize the effects of changing tire construction and size on load capacity:

2008 Colorado				
	LT Load Rating	P235/75 R15	LT235/75 R15	31X10.50R15LT
Front	1764 lb	32 psi	43 psi	35 psi
Rear	1754 lb	32 psi	43 psi	35 psi
1992 Wrangler				
	LT Load Rating	P205/75 R15	LT205/75 R15	31X10.50R15LT
Front	1440 lb	28 psi	43 psi	16 psi
Rear	1532 lb	32 psi	46 psi	18 psi

This is just a starting point. These air pressures are for fully loaded vehicles. Most of the time my pickup bed is empty, so I’m carrying at least 1,000 pounds less than the 2896 pounds Chevy calculated on the rear axle when they put that sticker on the door. My full-size pickup at work usually has about 3,000 pounds less in the bed than the manufacturer’s sticker shows. Consequently, the back ends of both of these trucks skitter around noticeably on potholes and rough roads because the rear tires – even at the manufacturer’s recommended tire pressure which is well below the tire’s maximum air pressure – are over-inflated. According to the load inflation table, I should be running the rear tires of the Colorado at about 25 psi when unloaded. However, because I do regularly throw stuff in the back and I don’t like constantly adjusting the air pressure, I usually run 30 psi in the rear tires.

The Jeep isn’t underweight by much because of all the stuff I carry in it. I’ve found that 23 psi in all the tires feels more responsive and doesn’t wander as much at sustained highway speeds. It probably gets a little better fuel mileage. I’ve found through experience that the tires wear faster in the center than at the edges at this pressure.

The point is this: Just as with airing down for trail riding, tire pressures for street and highway driving are not just “set it and forget it.” The vehicle manufacturer gives you a good starting point for recommended air pressure with a full load. This needs to be adjusted when you change tire construction and/or size. The air pressure again needs to be adjusted based on the loaded weight of the vehicle as you are using it. You need to think about other factors, too. The high center of gravity of a cab-over camper might require running the maximum air pressure the tires are rated for to reduce the amount of sway. Different tires handle differently due to their construction, so you might want to raise the pressure a bit for more responsive handling. Take into consideration the added tongue weight of the trailer you pull.

If you’ve done a lot of modifications to your vehicle or you load it as high as you can with wood or gravel, don’t guess at the weight. Most places with certified truck scales will be happy to weigh your rig for free or for a nominal fee.

If this is too complicated, just remember one thing: it’s better to over-inflate than under-inflate your tires. Running on soft tires can make your Jeep ride like a Cadillac, but the resulting tire failure at highway speed is going to be explosive and dramatic. If “set it and forget it” is your thing, follow the manufacturer’s recommendations or equivalent from the load inflation table for your replacement tire.