

ask the DOCTOR



As much as we preach inflation pressure maintenance, that might seem like a ludicrous question. What's behind it, though, is the issue of whether or not air is the best thing to use for inflating tires.

Lately, there's been more and more interest in using other gases, like nitrogen. Unfortunately, there's also a certain amount of bogus information out there regarding nitrogen as well. We'll try to provide some "real answers" regarding nitrogen's potential.



Air

78.1% Nitrogen

20.9% Oxygen

1% Other Gases

Is nitrogen inflation new?

It's been used on giant off-highway tires, on aircraft tires, and on racing tires for many years

Why did they switch?

Air is about one-fifth oxygen, and oxygen, especially at high temperatures and pressures, is a very reactive element.

When oxygen reacts with things, the process is called oxidation. When oxidation is extremely rapid, the process is called "burning."

That's one reason nitrogen is used in off-highway and aircraft tires. These tires run so hot they can actually catch on fire.

Nitrogen doesn't support combustion, so nitrogen-filled tires don't add fuel to the flames. And, nitrogen helps prevent slower forms of oxidation too.

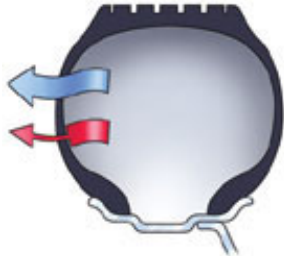
How does that happen?

Air migrates through rubber. Truck tires can lose 2 psi per month as a result of air passing through their sidewalls – like a balloon that shrivels up, but much slower.

That's why regular inflation pressure checks are a must. Even if there's nothing "wrong," you can still be losing pressure.

And, when oxygen passes through rubber, it can come into contact with steel cords, causing them to rust too.

Between aging rubber and corroding steel cords, oxygen reduces retreadability.



Because air can migrate through sidewalls, truck tires can lose up to 2 psi per month, even when valves and beads seal properly and there are no punctures.

How does nitrogen help?

While both nitrogen and oxygen can permeate rubber, nitrogen does it much more slowly. It might take six months to lose 2 psi with nitrogen, compared to just a month with air.

And, nitrogen is far less reactive. It doesn't cause rust and corrosion on steel or aluminum, and it doesn't degrade rubber.

Wheel surfaces stay smooth and clean, rubber remains supple and resilient. Inflation losses are minimized – and retreadability is enhanced.

Are there other benefits to nitrogen inflation?

The air around us is full of water vapor. It's called "humidity." Compressing air concentrates the water in it.

Draining water from your air lines every day helps, but unless you have a really efficient air dryer, chances are there's lots of water in your compressed air.



When you compress air, it takes up much less volume, but the percentage of water by volume is greatly increased.

What's the harm in that?

Water vapor in compressed air acts as a catalyst, accelerating rust and corrosion.

Water vapor also absorbs and holds heat. And, when it changes from liquid to vapor, water expands tremendously in volume.

So, tires inflated with wet air tend to run hotter and fluctuate in pressure more. That's why racing tires, where fractions of a psi can radically change handling, are inflated with dry nitrogen.

Where would we get nitrogen?

Some people use high pressure cylinders or big containers of liquid nitrogen as their source, but several companies now offer machines that separate nitrogen from air.

These machines can produce nitrogen that's 95 percent or more pure, taking it from the inexhaustible supply in the air around us.

Do we have to do something special to fill our tires?

Not really. If you take a truck tire that's just been mounted, and inflate it with 95 percent nitrogen, you'll end up with a concentration of about 93 percent nitrogen in the tire. That's good enough to do the job.

Why wouldn't it be 95 percent?



WATER

+HEAT

=VAPOR

Because the tire was full of air. So there was some oxygen in it before you added the nitrogen.

What do we do when we're out on the road?

Chances are, as it becomes more popular, you'll find nitrogen inflation equipment at truckstops.

But in the meantime, consider this: With nitrogen inflation, you won't need to "top off" your tires nearly as often – or as much.

And, if you do need to add pressure, the little bit of air that you might put in will have very little effect.

If you have nitrogen inflation capability at "home," when trucks come in, you can let the air out of their tires and re-inflate them with near-pure nitrogen.

That will bring the concentration of nitrogen inside your tires back to optimum levels.

Is nitrogen inflation cost-effective?

That's going to depend on your situation. If your trailers go out and don't come back for six months or more, being able to keep consistent inflation pressures may greatly lengthen tread life.

Some tests have shown increases of up to 26 percent. Less rubber aging and tire cord rust could also yield a higher proportion of retreadable casings – and casings that can survive more retread cycles.

That cuts cost per mile too.

There's nothing you can do that is better for your tires than maintaining the right inflation pressure – all the time.

Nitrogen could help you do that. We'll keep you posted on developments in this area.



While dry nitrogen is available from welding supply shops, there are also machines that will extract nitrogen from air.



Parts N2
+ Parts other gases

add Nitrogen 95 + 5
 add Nitrogen 95 + 5
 add Nitrogen 95 + 5
 add Nitrogen 95 + 5
 add Nitrogen 95 + 5
 add Nitrogen 95 + 5
 add Nitrogen 95 + 5
 to "Empty" tire 80 + 20

745 + 55

Total: = 800 parts

745 parts nitrogen
- 800 parts all gases
= 93% nitrogen

realANSWERS

© 2006-2007 BFNT, LLC | legal notice

NEXT 

<< close >>