

October 04, 2007

Tires - Nitrogen air loss study

Filling tires with nitrogen rather than air is becoming a common practice in the replacement tire market. This service offers tire dealers another avenue for making money while also promoting safety. The claimed safety benefits often include the potential for reducing air loss compared to an air-filled tire. Maintaining proper inflation can help prevent tire overheating; promote optimum tread life; and reduce rubber aging and wheel corrosion. The use of nitrogen in large truck fleets and the commercial tire industry are well documented and support these claims.

The National Highway Traffic Safety Administration (NHTSA) has seen reduced aging of tires filled with nitrogen. Though the data does support that passenger car tires could benefit by all the claims made for nitrogen, tire manufacturers say that they already design tires to perform well with air inflation. And while nitrogen will do no harm, manufacturers say that they don't see the need to use nitrogen, which generally adds \$5 or more per tire charge.



Consumer Reports wanted to find out if nitrogen is worth the price, so we purchased a Nitrogen Inflation System and checked out how well the inflation held up over a one year period. We evaluated pairs of 31 tire models of H- and V-speed rated, all-season tires used in our tread wear test from 2006. We filled one tire per model with air and the other with nitrogen. The test was quite simple: fill and set the inflation pressure at room temperature to 30 psi (pounds per square inch); set the tire outdoors for one year; and then recheck the inflation pressure at room temperature after a one year period.

The tires were filled and deflated three times with nitrogen to purge the air out of the tire cavity. We also used an oxygen analyzer to be sure we had 95-percent nitrogen purity in the tire--the claimed purity limit of our nitrogen system, which generates nitrogen gas from ambient air.

The test started on September 20, 2006 and the final measurements were taken on September 20, 2007. The results show nitrogen does reduce pressure loss over time, but the reduction is only a 1.3 psi difference

from air-filled tires. The average loss of air-filled tires was just 3.5 psi from the initial 30 pressure setting. Nitrogen-filled tires lost an average of 2.2 psi from the initial 30 psi setting. More important, all tires lost air pressure regardless of the inflation medium, so consumers should check their tires' air pressure routinely. No evaluation was done to assess the aging claim.

Bottom line: Overall, consumers can use nitrogen and might enjoy the slight improvement in air retention provided, but it's not a substitute for [regular inflation checks](#).

--Gene Petersen

		Air		Nitrogen	
Consumer Reports.org®		Actual psi loss over one year	Adjusted psi loss over one year*	Actual psi loss over one year	Adjusted psi loss over one year*
1	BFGoodrich Traction T/A HR	7.6	7.2	7.2	6.8
2	Bridgestone HP50 (Sears)	3.8	3.9	2.5	2.0
3	Bridgestone Potenza G008	3.7	3.2	1.6	1.1
4	Bridgestone Potenza RE950	4.7	4.2	1.5	1.0
5	Bridgestone Turanza EL400	2.1	1.6	1.0	0.5
6	Continental PremierContact H	4.9	4.4	3.1	2.6
7	Cooper Lifeline Touring SLE	5.2	4.7	3.5	3.0
8	Dayton Daytona HR	3.4	2.9	3.2	2.7
9	Falken Ztex ZE-S12	4.1	3.6	3.3	2.8
10	Fuzion Hri	2.7	2.2	2.2	1.7
11	General Exclaim	3.1	2.6	3.4	2.9
12	Goodyear Assurance TripleTred	3.8	3.3	3.2	2.7
13	Hankook Optimo H418	3.0	2.5	0.9	0.4
14	Kumho Solus KH16	6.2	5.8	3.4	2.9
15	Michelin Energy MXV4 Plus	2.0	1.5	1.8	1.3
16	Michelin Pilot XGT H4	1.1	0.6	0.7	0.2
17	Pirelli P8 Four Seasons	4.4	3.9	4.2	3.7
18	Sumitomo HTR IH4	1.4	0.9	2.1	1.6
19	Yokohama Avid HHS	4.3	3.8	3.0	2.5
20	BFGoodrich Traction T/A V	5.5	5.0	3.4	2.9
21	Bridgestone Potenza RE950	4.1	3.6	2.8	2.3
22	Continental ContiExtremeContact	5.0	4.5	3.4	2.9
23	Continental ContiProContact	4.8	4.3	3.3	2.8
24	Cooper Lifeline Touring SLE	3.2	2.7	2.5	2.0
25	General Exclaim UHP	6.8	6.4	2.7	2.2
26	Hankook Ventus V4 H105	3.1	2.6	1.4	0.9
27	Michelin Energy MXV4 Plus	2.5	2.0	1.5	1.0
28	Michelin Pilot Exalto A/S	6.6	6.2	2.2	1.7
29	Michelin Pilot HX MXM4	2.2	1.7	2.0	1.5
30	Pirelli P8 Four Seasons	2.5	2.0	2.7	2.2
31	Sumitomo HTR+	4.4	3.9	3.7	3.2
	Average	3.9	3.5	2.7	2.2
	Stdev	1.6	1.6	1.2	1.2
	min	1.1	0.6	0.7	0.2
	max	7.6	7.2	7.2	6.8
	*Data adjusted for barometric pressure @ 101.3 kPa, 1 ATM @ 75F				