



Lower Pressures for Radial Tractor Tires?

Donald R. Daum, Professor of Agricultural Engineering

Radial tires often appear underinflated when they are not. But, there may be good reasons to operate radial tires at even lower than normal pressures. Recently, trade journals and some tire manufacturing companies have been promoting the use of very low air pressures in radial tractor drive tires. Using inflation pressures as low as 6 or 8 psi have been suggested to increase traction and to save fuel and time, thereby increasing overall operating efficiency. Savings depend on conditions. In an Ohio test, field capacity (A/hr.) increased 4.1% and fuel consumption (gals./A) decreased 8.3%.

But there can be problems with too little air pressure. Cautions need to be noted in implementing this concept. First these low pressures are recommended for radial tires only, not for bias-ply tires. The sidewalls of bias-ply tires would fail in a very short time at these low pressures. The advantages gained in field tests have been with **radial tires only**.

Another major caution is the weight carrying capacity of a tire, which depends on the inflation pressure, must not be exceeded. Manufacturers provide information on load capacity for tires inflated to specific pressures. (See table below). **Tires must be inflated adequately to carry the weight imposed on them.** For example, the table indicates that a set of 18.4R38 dual tires can safely carry a load of 8,560 pounds at 14 psi but only 5,760 pounds at 8 psi. Single tires must be inflated to higher pressures to carry the load that would be shared by duals or triples. In reality, this usually limits the low-pressure concept to dual or triple tires. Some tire manufactures still recommend that the minimum inflation pressure for single radial tires remain the same, typically 12 or 14 psi. Low pressures may also be used in front tires of four-wheel drive tractors if no liquid ballast is added.

Both cast or liquid ballast may be used but cast weights are clearly preferred. Liquid ballast in tires operated at these very low pressures increases tire stiffness. Usually four-wheel drive tractors don't require ballast on the front, but cast weights should be used if extra weight is needed. Then adjust to optimum pressure. Rear tires on any tractor should not be filled more than one-half full (1/4 to 1/3 is preferred) and the liquid must be equally divided among all dual and

triple tires so they all have the same stiffness. On front-wheel-assist drive tractors, liquid ballast should not exceed 75% of the tire volume in front tires and tire pressure should be adjusted to standard values.

Loads on tires can be determined by weighing a tractor, one axle at a time. To find the load per tire divide the total axle weight by the number of tires. Be sure to include any mounted equipment, towed equipment that puts a heavy load on the drawbar, a full fuel tank, and the operator, as well as ballast. Under field conditions, the loading may be greater due to weight transfer to the rear axle. Tires must be properly inflated to carry this additional load under working conditions, but this additional weight is already considered in the table values. Also if operating on slopes, the tires on the lower side are loaded more than the upper tires. Tire manufacturers recommend an extra 4 psi for tractors operating on side slopes to carry the extra weight and to maintain stability.

If you have radial tires that are overinflated for the weight they must bear, there is a good chance that lowering pressures would improve performance. Field checks have shown improvements in traction, fuel use, and field capacity. The lower tire pressure also means lower pressure on the soil and less compaction near the soil surface. Of course the tire/soil contact (footprint) area is larger to carry the same tractor weight. Since traction is improved, you may be able to remove some ballast.

Even if you cannot go to the limit on low pressures, advantages can be gained by reducing tire pressures to the minimum for the load being carried. In field tests in Ohio, important improvements were obtained by reducing tire pressure from 20 psi to 14 psi. Lower tire pressures may also reduce or eliminate power hop. Be sure to use an accurate tire pressure gage to check tires weekly. A two psi error at 20 psi is only a 10% error but a 2 psi error at 8 psi is a 25% error! Always check air pressure when the tires are cool.

But remember, inflation pressures still must be maintained at a level adequate to carry the load and the low-pressure concept applies only to radial tires.

Table 1. Load and Inflation Values for Radial Drive Wheel Tractor Tires*

Tire Load Limits (Lbs. at various cold inflation pressure (PSI))											
Tire Size	Tire Configuration	6	8	10	12	14	16	18	20	22	24
18.4R38	Single	2600	3090	3510	4440	4860	5260	5680*	5980	6350	6600**
	Dual	2430	2880	3270	3910	4280	4630	5000*	5260	5590	5810**
	Triple				3640	3990	4310	4660*	4900	5210	5410**
18.4R42	Single	2750	3260	3700	4680	5120	5540	6000*	6300	6650	6950**
	Dual	2560	3030	3450	4120	4510	4880	5280*	5540	5850	6120**
	Triple				3840	4200	4540	4920*	5170	5450	5700**
18.4R46	Single	2890	3420	3900	4920	5400	5820	6150*	6650	7000	7400**
	Dual	2690	3190	3630	4330	4750	5120	5410*	5850	6160	6510**
	Triple				4030	4430	4770	5040*	5450	5740	6070**
20.8R38	Single	3150	3740	4260	5380	5880	6350	6800*	7250	7650	8050**
	Dual	2940	3490	3970	4730	5170	5590	5980*	6380	6730	7080**
	Triple				4410	4820	5210	5580*	5950	6270	6600**
20.8R42	Single	3330	3940	4500	5680	6200	6700	7150*	7650	8100	8550**
	Dual	3100	3670	4190	5000	5460	5900	6290*	6730	7130	7520**
	Triple				4660	5080	5490	5860*	6270	6640	7010**
24.5R32	Single	3780	4490	5100	6450	7050	7650	8250*	8700	9200	9650**
	Dual				5680	6200	6730	7260*	7660	8100	8490**

* Table courtesy of Bridgestone/Firestone, Inc.

References

“Maximize Tractive Performance of Radial Rear Tractor Tires with Proper Inflation,” Agribusiness Technical Bulletin F-039-X, Firestone Agribusiness, 730 E. 2nd. St., Des Moines, IA 50309 (1-800-847-3364 or 216-379-4069), 5 pp.

“Optimum Tractor Tire Performance Handbook,” The Goodyear Tire & Rubber Co., Box 3531, Akron, OH 44309-3531 (216-796-9135), 20 pp.

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