

SECTION 11 - TIRES (46:10)

11.1 FUNDAMENTALS (46:10)

Tire condition and maintenance are important in preserving the quality of cut of any grass cutting machine. Tires should be inspected regularly for proper inflation and signs of cuts, bulges, cracking or other damage. A tire which is not properly inflated can damage turf, accelerate tread wear and make operation difficult.

What happens when tires are not inflated according to specifications?

When a tire is properly inflated, the air pressure acting on the inside of the tire holds the weight of the machine while maintaining a sidewall profile with minimal bulge or flexing. At the same time, the air pressure keeps the tread in even contact with the surface. When properly inflated, the tire tread will wear evenly across the width of the tread, indicating full surface contact. See Figure 11-1.

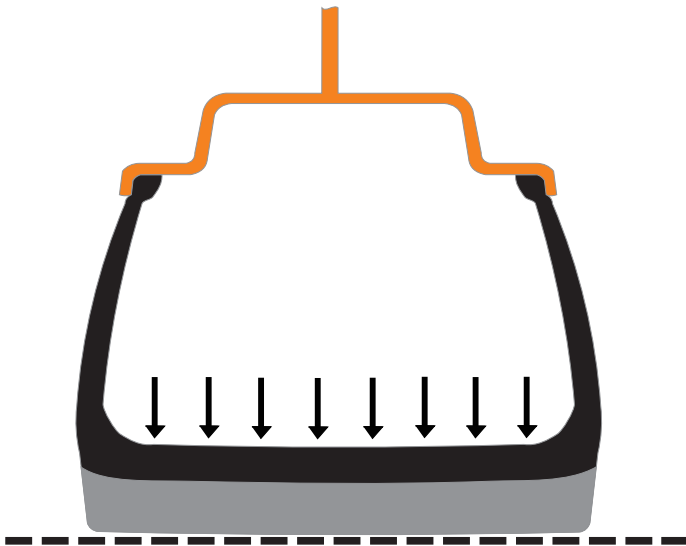


Figure 11-1 Correct Tire Pressure

When a tire is underinflated, the air pressure does not adequately press the center of the tread down onto the surface. Instead, the weight of the machine is transmitted directly to the surface below the sidewall. This results in overloading and extensive flexing of the sidewall, and accelerated wear and scuffing at the outer edges of the tread, with minimal wear at the center of the tread. See Figure 11-2.



Figure 11-2 Underinflated Tire

If overinflated, the air pressure inside the tire causes the tire to expand to a larger diameter than normal. Specifically, the center of the tread expands outward, pulling the sidewalls in, and lifting the outer edges of the tread off the surface. Overinflation is evident when heavy tread wear is observed down the center of the tread, with relatively little wear at the edges. See Figure 11-3.

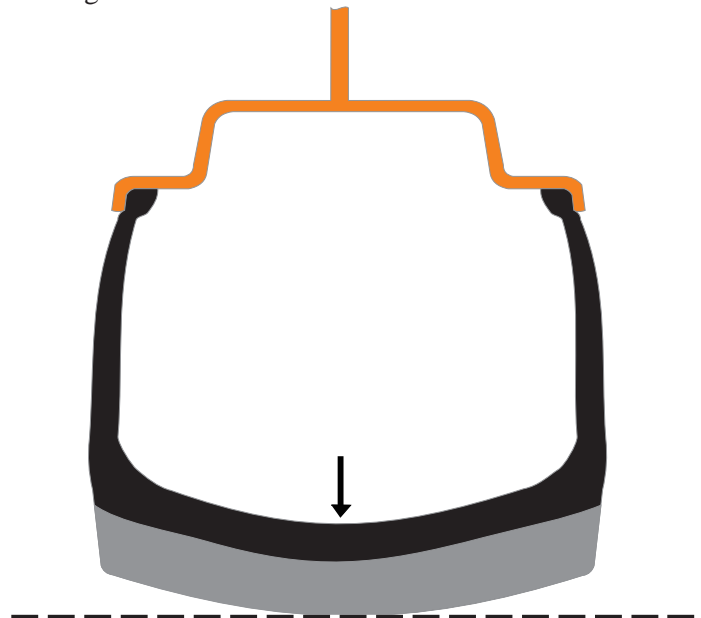


Figure 11-3 Overinflated Tire

In addition to irregular wear, over-or underinflation changes the load radius of the tire. The distance travelled per wheel revolution is affected as the tire is operated at a smaller load radius if underinflated, or a larger load radius if overinflated. These differences in travel distance can result in poor straight line tracking, and unnecessary effort to control the machine.

This information is important not only for the technician, but should be passed on to machine owners as well. Regular attention to tire maintenance and pressure adjustment takes only seconds per day, but can reward the machine owner or operator with longer tire life, better machine performance, and easier operation.

Figure 11-4 illustrates the relative difference in load radius between properly inflated tires and tires which are overinflated, or underinflated.

Translating these differences into distance travelled per tire revolution, a distance is first established for the properly inflated tire. The tire travel per revolution with an underinflated tire is observed to be substantially less, while the travel of the overinflated tire is much greater than if correctly inflated.

This illustration shows that tire inflation should be checked first when a change in tracking on a hydrostatic machine is being evaluated. The change in load radius as inflation pressure changes will make the unit, which normally tracks well, difficult to operate as the machine pulls toward the side with lower pressure tire.

Likewise, a slight difference in tire diameter, even when properly inflated, may cause a gear drive SW to track off-center. Since the SW has a single output for both drive wheels, slight adjustments to inflation pressure can be used to “fine tune” the tire diameters for best straight line tracking operation.

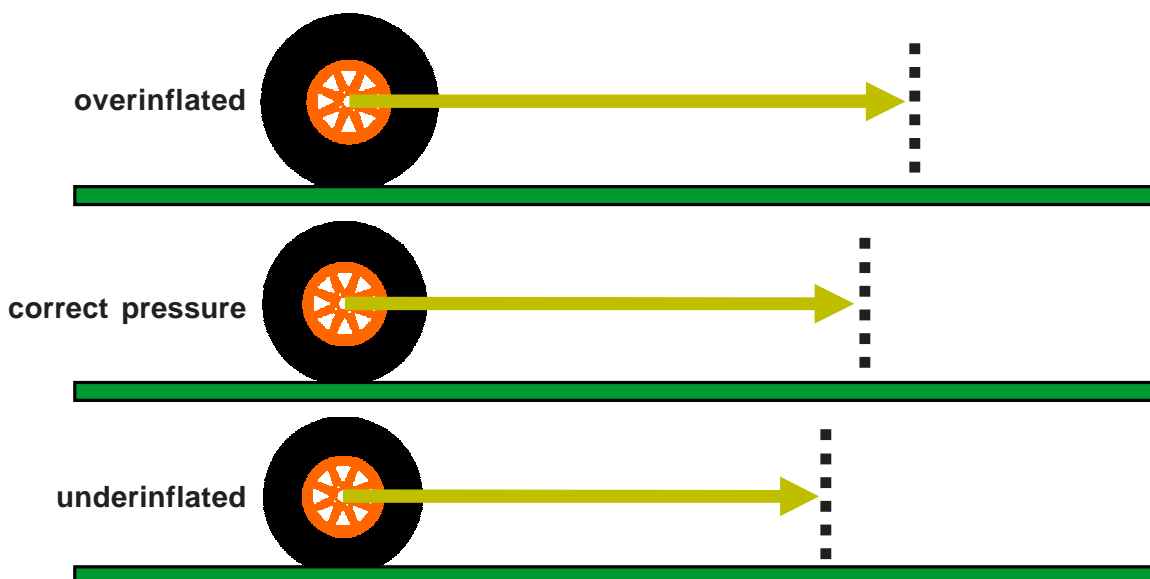


Figure 11-4 Tire Pressure vs. Distance Traveled