



Tractor Weight and Ballasting

Understanding how the weight of a tractor can positively and negatively affect performance is an important consideration. A tractor's weight can be influenced by the addition or removal of ballast (added weight) in the form of liquid installed in the tires, cast iron weights added to wheels or bumpers, and/or equipment hooked to the three point hitch. As weight is added to a farm tractor, it will generally gain traction and stability, but it will tend to get stuck easier in soft ground, burn more fuel, and be heavier to haul. As weight is taken away, the opposite holds true; with reduced weight, stability and traction will decrease, but the tractor will become more surefooted in soft ground, gain better fuel economy, and be easier to transport on a trailer.

All tractors have a "base weight" that cannot be altered without removing major components. In other words, if an unballasted tractor weighs 6,000 lbs, we cannot make it weigh any less while still being a complete unit. If we removed the wheels to make it lighter, we'd be foolish since we'd now have an expensive yard ornament. We can take this same 6,000 lb tractor and add ballast to it as necessary, and achieve the perfect total machine weight for our application.

There are various conditions where additional weight can be an asset. This often means ground-engaging activities. For example, if a farmer is plowing a field with a large offset disk, he'll want as much weight as possible on the tractor. As he adds ballast, his wheel slip will decrease, resulting in increased efficiency. The rule of thumb for adding ballast is generally to try to get to around 10% wheel slip. Any less slip than that, and you'll burn more fuel and stress your drivetrain more than is necessary. In addition, an overballasted tractor will tend to feel sluggish and hard to maneuver. In our example above of the farmer plowing his field, if he failed to add enough ballast to get his wheel slippage in that magical 10% range, he'd find that his tire wear would rapidly increase. Also, he'd be delivering much less horsepower to the drawbar, and since his wheels are turning many more times to cover the same distance, he'd burn more fuel. His tractor could literally be spinning its wheels while plowing the field. Think of having a little wheel slip as a built-in safety for your drivetrain to protect it from excessive wear.

Conversely, there are conditions where a heavier tractor, or a tractor with too much added ballast for the job at hand, can be a detriment. Hayfield tractors are a good example. For the hayfield, let's consider what kind of implements we use. We pull a disc mower, either three-point hookup or pull-type, to cut the crop. In some cases it may need to be tilled. We pull a rake to windrow it. And then we pull a PTO-driven baler to bale it. In all cases, additional weight is not only unnecessary, it's generally unwanted. Additional weight makes the tractor burn more fuel since it's having to carry around extra weight while getting no benefit from it. The extra weight is not reducing wheel slip to

within our guideline; our wheel slip is already acceptable with no additional weight. In situations where fields tend to be muddy or have soft spots, heavier tractors will usually be the first ones to “drop out” and get stuck. When hauling a tractor on a trailer, unnecessary weight is also wasteful.

If you're in the market for a tractor, new or used, consider the weight of the tractor in your purchasing decision. You'll find that the weights of tractors sometimes vary between different makes and models. Avoid the pitfall of buying one tractor over another based solely on machine weight; a lighter weight tractor tends to be more versatile in that you can always add ballast to achieve the perfect balance for the job at hand.

-Greg Beaver