



The Importance of Proper Torque

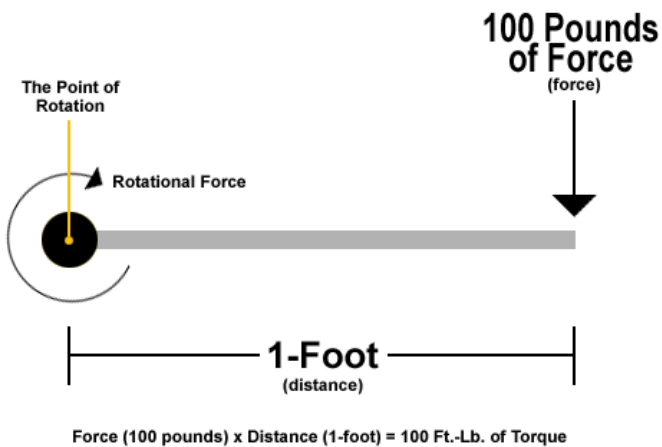
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Proper Torque

If you've never thought about whether the proper torque on a bolt or nut is important, think about your drive into work today. Did you lose one of your wheels? Did your engine come apart on the interstate? Since you are reading this, chances are they didn't. The reason they didn't is because when those nuts that keep your wheel fastened to the studs on your axle and the bolts that secure and keep your engine assembled were installed at the proper torque to keep them from coming loose. When accurate torque is not applied to the bolts and nuts, they wear out quickly and can cause failure.

Depending on the application and the type of failure, this can result in a costly decision, or possibly even death. Just last year after an F1 race in Hungary, team Renault was suspended after a wheel came off of Fernando Alonso's car in the middle of the race. It was determined by officials that the wheel had not been properly torqued down. F1 cars drive at extremely fast speeds and push the envelope when it comes to automotive engineering, but it doesn't matter how spectacular they are if the wheels are flying off at 200 mph!

Torque is essentially rotational energy about an axis or pivot point. Levers work off of this principle. You probably remember the see-saw on the playground when you were younger. You were able to spend countless hours going up and up down on them with your friends because of the phenomenon of torque. The pivot point was the middle of see-saw where the board rested. Now you probably work at a facility where you use torque wrenches, torque watches, torque screwdrivers, and other torque devices. The same form of energy you used to expel during recess is also used to manufacture products. However, unless the proper amount of torque is applied, quality can suffer and ultimately so can sales.

Torque Device Use

To achieve proper torque on a bolt or a nut, a torque device should not be handled like a normal wrench or screwdriver. It is calibrated to provide precise torque, which is essential in the assembly process. Whereas a standard wrench might be used as a hammer in a pinch, a torque wrench should never be used for anything other than its intended use. Even dropping the wrench might render its accuracy unsatisfactory. People also make the mistake of using torque wrenches to make the initial turns of the bolt or screw. The torque wrench should only be used once the bolt or nut is finger tight.

Storage

Storing torque wrenches and meters in a relatively non-humid environment and returning the equipment to its case after each use are two easy ways to extend the life of the torque equipment. A torque wrench should always be unloaded to its lowest torque setting and wiped off before being stored in its case. Dirty humid environments wreak havoc on the pivot points and the gears of this type of equipment. The dirt can cause extra resistance in a measurement, which in turn requires more force to rotate, and ultimately causes an inaccurate reading.

Keep it Level

If 10 people take the same clicker-type torque wrench and all try to generate the same torque, chances are there will be a wide range of measurements. How can that be if the wrench is set on one point? It can be safely assumed that some will pull the wrench at different angles, some

will pull with the wrench unlevel, and some will pull at different points on the handle. All these factors will change the amount of torque being applied. It is imperative that the wrench be kept as level as possible and that the force applied at the handle is routinely applied in the middle of the handle.

Going Both Ways

In torque applications, whether it be for a plastic screw on a computer motherboard or a hardened steel bolt that connects I-beams on an interstate overpass, rotations are expressed in terms of clockwise and counter-clockwise operation. Believe it or not, there are some nuts and bolts that tighten opposite of the typical “righty-tighty, lefty-loosey” standard. This is why torque equipment is usually bi-directional. However, there are wrenches that only give accuracies in one direction, or they have a different accuracy for each direction.

Going back to the notion that torque equipment should only be used for its intended purposes, they shouldn't be used in the opposite direction in which they tighten to loosen nuts and bolts. Again, the purpose of a torque device is to ensure the proper torque when *tightening* a nut or bolt, not to loosen anything. A standard wrench or screwdriver should be used to perform those tasks.

Summary

Although it might be convenient to use a torque wrench as a hammer or to loosen nuts and bolts, it should not be done. They have the appearance of a normal tool, but they should be viewed and treated like a piece of accurate lab equipment. Whether manufacturing a product or maintaining one the proper torque should always be applied. It will guarantee even wear on fasteners and prevent bolt heads from snapping off.