

*The authoritative guide to reducing commercial tire expenditures from  
Pressure Systems International,  
the manufacturer of the Meritor Tire Inflation System by PSI™*

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## Tire Pressure Gauges - Why the Variance?



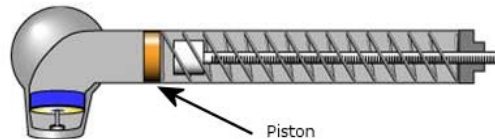
Recycled Tire Sculpture

Common stick or pencil type tire pressure gauges are primarily used to check the air in passenger cars. When the air is checked in commercial truck tires a stick gauge is also used, but one with a higher pressure range. Since you are likely relying on these types of gauges to check air pressure on your fleet vehicles it's important to know: Are they any good? Are they accurate? Do they change over time?



Common Stick Pressure Gauge

To understand gauge accuracy, it needs to be taken apart to check the components.



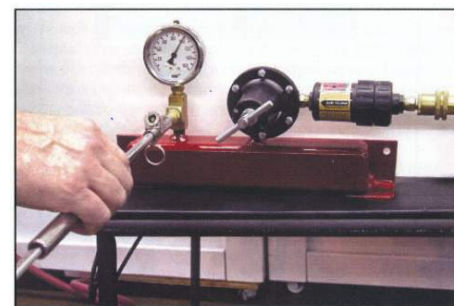
How a stick or pencil gauge is put together and how it works:

- **Calibrated stick with numbers fits inside the helical spring**
- **When gauge is applied to the tire valve stem, pressurized air rushes in and pushes the piston to the right and the spring is pushing back...calibrated rod (stick) moves to the right**
- **When pressure is released, piston moves back to the left but the measuring stick stays in place so you can read the measurement**

There are 2 key components of the gauge: the spring and the stick with the numbers. A good gauge will have been calibrated properly & the pressure numbers marked appropriately at the factory to match the spring. However, even a brand new reasonably priced gauge will only be accurate to +/-3%. Over time, this inaccuracy increases.

For instance, the spring constant or spring stiffness will change significantly based on the ambient temperature. Most pressure gauges are calibrated at a room temperature of 68° F. If you are checking tire pressures in the middle of winter and it is 20° F, the spring stiffness will increase and any readings you take may be significantly lower by several PSI or more. Conversely, when you do a tire survey in Phoenix during the summer, the spring stiffness decreases and the pressure results will be higher by several PSI. Another factor affecting accuracy is that this type of gauge gets dropped (on hard shop concrete floors) and over time, the stick will not sit properly inside the spring causing additional error. And of course, there is error associated with reading the correct number on the stick, especially with bifocals!

Utilizing a master air gauge check station is the best way to verify your stick gauges for accuracy. But you need to be aware that even a master gauge is only accurate to +/- 2% when brand new.



In the May issue of PSI's Commercial Fleet Tire Digest we will review stick versus dial type pressure gauges.

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