# Are Alignments on Trucks and Buses a GREEN procedure or a Money Drain (Part 11)

More on Inflation: In the last post I referred to "Cold Inflation". What does that infer? That means the tire has been at rest for at least 2 hours, preferably not in direct sunlight. When a vehicle comes in off the road the tires are hot and under Boyles Law the gas in the tire has expanded and increased the pressure. To get the actual "ambient temperature" pressure, you must allow the tire to cool down. Direct sunshine on one side of the vehicle will heat up those tires and affect the PSI readings. This means that whether the temp outside is 104 Degrees F or -20 degrees F, the pressure should be set as indicated on the appropriate charts at that temp.

There is a complication to this situation. Very few shops are refrigerated, so in warm weather the outside temp and the shop temp tend to be the same. No Problem. However most shops have heat so in the winter the temp outside can be significantly lower than in the shop. In Michelin's Tire manual I found a "Cold Climate Pressure Correction Data Chart". It gives the appropriate pressure at shop temp so that when you move the vehicle outside and the cold contracts the gas in the tire, you wind up at the correct inflation. For example if your shop is 65 degrees F and the outside temp is -20 degrees F, in order to have 110 PSI in the tires outside you need 134 PSI inside. The PSI will reduce 24 Lbs when it cools to the Ambient Temp. If you had set the PSI in the shop to 110 when you backed out the PSI would reduce to about 86 PSI. This creates a significant under inflation and subsequent tire wear and handling issues. There follows another problem. Some shops do not have that much pressure in the air systems. How do we properly inflate the tires if the pressure is not available?

Now let's talk about when the tire heats up during operation. The heat comes from the flex in the sidewall. That generator of heat is controlled by 4 factors. The first two are Load and inflation. The combination of these dictate how much the sidewall will flex. Too much flex creates too much heat and degrades the tire. The second two are speed and Ambient Temp. Speed determines the number of times a particular section of sidewall will flex per minute. At 60 MPH it flexes 525 times per minute. The Ambient temp controls the cooling that will occur as air passes by the tire. Cold air removes heat efficiently. Hot air, not so much. The speed range for tires are contained in the Tire manuals. For tires rated for 75 MPH the speed range is from 30 MPH to 75. At speeds above or below that increased pressure is necessary. The standard temp range is from 40 degrees F to 60 degrees F and again, at temps above or below those increased pressure is needed. Too much heat from either speed or the inability to cool because of high Ambient Temps require a stiffer sidewall to reduce heat generation. Conversely, Not enough heat due to slow speeds or too efficient cooling require more pressure to reach the ideal operating pressure.. Keep in mind the cold inflation is not the proper operating pressure. It is just the starting pressure that combined with expected operational conditions should result in the correct operating pressure.

There are a couple more items to mention about inflation so I will make one more post to cover those.