



COMMERCIAL FLEET TIRE DIGEST

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

VOLUME 9 ISSUE 1

JANUARY 2015

Getting the Most out of your Tire Program for 2015

Best Wishes for a Happy and Prosperous



January is always a good time to review your current fleet tire program and to develop objectives to reduce costs for the coming year. What tires are you specifying for the new equipment? Tire companies continue to develop new tires for specific service vocations that maximize tire removal mileage, increase traction, improve fuel economy and increase retreadability. Your new equipment should be specified with the latest tire technology that will help achieve your tire cost reduction goals for 2015 on tractors, trailers, and dollies.

The same tire make/model can perform quite differently depending on the specific tractor and trailer. Establishing a baseline for target tire removal miles on the various equipment running in the fleet is an important part of the tire program process. These mileages will vary depending on the specific service vocation that the vehicle travels. If, for example, Freightliners, Navistars, and Volvos are all running in your line haul service operations, you will then want to establish how the same steer and drive tires are performing on each of these vehicle models. You may discover that tire model A is averaging over 175,000 to removal on the Freightliners and Navistars but is only getting 150,000 miles on the Volvos. This would indicate that tire model B might be a better choice to get you those extra miles on the Volvo tractors. This is the type of analysis required by gathering data over time. It is not necessary to track every tire in the fleet from birth to death over multiple retreads. If the size of your fleet supports it, choosing (30) tractors of each configuration will give you a solid statistical analysis. It is much easier to follow the tires on (30) vehicles versus 3,000. Certainly smaller fleets will need to adjust accordingly choosing a number of units that will establish a good sample for them.

It is also important to establish a consistent target tread depth target when removing tires from service. Since retreading is such an important part of any fleet tire program to reduce their tire costs, it is critical to protect the casing from cuts, stones, and damages. Running the tires down to the 4/32" legal limit for steers and 2/32" for all other tire positions is positive to maximize tire removal miles but will have a negative impact on retreading. Choosing a target tread depth in the 6 - 8/32" range will protect the tire casing. A retread is typically 1/3 to 1/2 the price of a new tire so it is in the fleet's best interest to protect this valuable asset from cuts and damages.

When tires come out of service they should be worn smooth and evenly down to your target tread depth. If tires develop uneven and irregular wear this will not only adversely reduce your fuel economy but tires will be removed prematurely. Identifying the issues which led to the irregular wear and then coming up with a plan to remedy the situation will help lower your tire costs for the future. Running tires underinflated is a major cause of both early removals due to uneven wear, and also the extra heat generated by the underinflated condition will lead to retreadability issues.

If you look at the fleets with successful tire programs they have one item in common - TRAINING. Technicians and drivers need to be educated regarding tires on a regular basis. Not just the first day they join the company. Drivers are the early warning for any tire issues. The morning vehicle walk-around can identify tires that are beginning to develop signs of uneven wear and low tire pressures. Running your hand across the tread of steer tires can determine if vehicle alignment is an issue. Being proactive is the best way to reduce tire costs and improve your tire program. Always work with your tire suppliers to insure that you are running the best tire for your fleet operations.

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Q&A PSI ANSWERS YOUR QUESTIONS

- Q.** Do you recommend the "stick" air pressure gauges that have an adjustment screw for calibration?
- A.** Yes. Tire pressure gauges are only accurate to +/- 3 psi even when brand new regardless of brand. It is important to check gauges regularly versus a master gauge. Dropping a gauge even a few times on the hard concrete will change the pressure accuracy. Stick gauges that are adjustable will insure proper calibration.

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VOLUME 9 ISSUE 2

FEBRUARY 2015

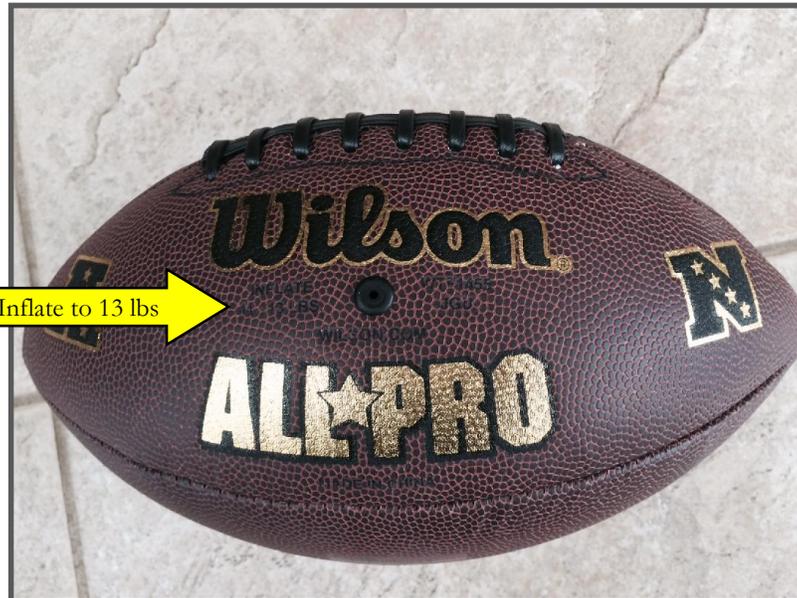


P.S.I. By The Numbers

P.S.I.'s
Automatic Tire
Inflation
Systems now
being used in 44
countries
worldwide

Footballs & Tires – A Lot of the same Issues

“Deflate-gate” sure has generated a lot of interest and controversy over the last several weeks. Football air pressure issues including temperature effect, and even pressure gauges, have come under scrutiny. It’s the same exact issues we have been preaching for over 20 years on how important it is to maintain the proper inflation in tires. We could give the NFL our take on this whole football deflation story. Air is what carries the load in tires. If you know the worst case load the tire sees in your service vocation, you can set the proper inflation which gives you the perfect tire footprint, maximizes fuel economy & treadwear and minimizes sidewall deflection. The football grip and aerodynamics behave differently when football air pressure is lower or higher versus spec. Wilson footballs have the recommended tire inflation stamped on every ball – 13 lbs.



Official football: “Inflate to 13 lbs”

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If you inflate a truck tire to 100 psi at an inside room temperature of 70° F and then move the tire into the hot sun, the tire air pressure will increase two psi for every increment of 10° F. So what does that mean? If the temperature was 110° F during the summer in Phoenix, the tire pressure would increase eight psi to 108 psi by just sitting there. Tire pressure would increase an additional 15 % or 16 psi to 124 psi after running the mounted tire on a loaded vehicle at 65 mph for 20 minutes.

If it was 0° F in Green Bay, Wisconsin. The same truck tire would lose 14 psi as the temperature moved from 70° F down to 0° F. So that 100 psi tire is now down to 86 psi at 0° F. Passenger car tires have much less volume compared to a truck tire. As a result, car tires only lose or gain one psi for every 10° F depending if the outside temperature was warmer or colder versus the 70° F when the tire was inflated. A football has even less volume than a car tire so the temperature effect would be significantly less than one psi for every 10° F. Tires are designed to handle this wide range of temperature extremes. Underinflation is always the worst scenario when it comes to tires leading to excessive heat build-up and premature tire removals.

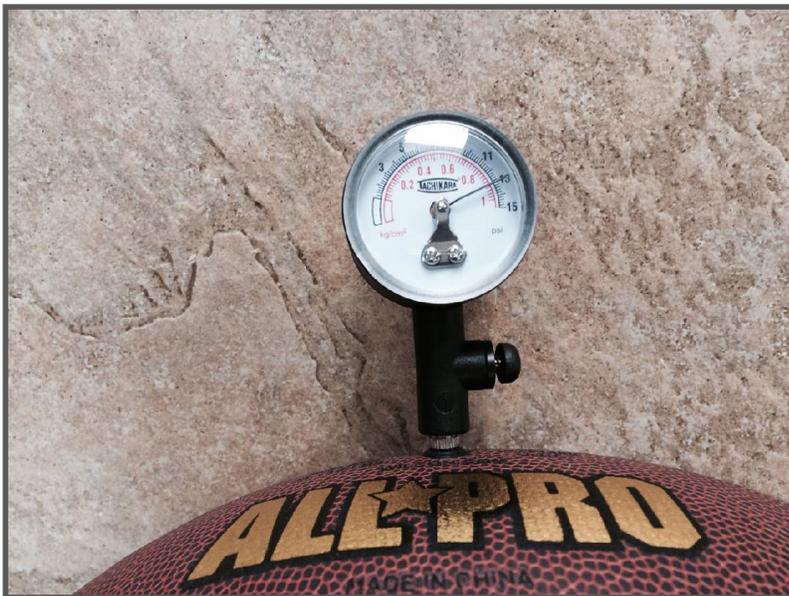
The specification for proper football inflation pressure is 13 +/- 0.5 psi. So a football could be inflated to 13.5 psi and be OK and also to 12.5 psi to be in compliance. I checked the NFL rule book, and they mention the football pressure specification range but not at a specific temperature.

P.S.I. THE INFLATION SYSTEM



This is where gauges come into play. Truck tire inflation gauges are accurate to only +/- 3 psi when they are brand new out of the box regardless of gauge brand. This means that a tire with 100 psi could be measured as 97 with gauge A or 103 psi using gauge B.

You drop it a few times on the hard concrete and the gauge accuracy drops even worse. Football pressure gauges cost in the \$5 - \$20 range and utilize the same design as truck tire gauges which are accurate to only +/- 3 %. All gauges need to be calibrated versus a master gauge on a regular basis. I purchased two ball gauges from different manufacturers and guess what, I got two different answers when checking the same ball.



Dial gauge read 13 psi and the stick gauge showed 11.75 psi on the same football.



If you look closely at this dial gauge face, the gauge reads from 2 to 15 psi. Gauges are most accurate in the middle of the range which is 5 - 9 psi. Gauge accuracy drops on both the low and high ends. In the case of footballs, 12.5 - 13.5 is near the top end of this gauge where the accuracy is less.

If I had purchased 50 gauges by each manufacturer, there would have also been a range of psi within the 50 gauges. There is variation from gauge to gauge by the same manufacturer and there is variation from vendor A to vendor B.

Bottom line is that there are many variables to consider & understand when it comes to football pressure, just like tire pressure.



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VOLUME 9 ISSUE 3

MARCH 2015

Handling Tire and Wheel Assemblies Safely

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International
at the
Mid America
Truck Show
Booth 12045

Because of the bending and lifting, working with tire/wheel assemblies can be difficult work. As the chart below shows, typical tire and wheel combinations can weigh anywhere between 163 pounds and 309 pounds.

OSHA, the Occupational Safety & Health Administration, has issued regulations (29 CFR Part 1910) that covers the step by step procedure in servicing tires and wheels. OSHA also publishes wall charts with photos detailing the proper demounting and mounting procedures for truck and bus tires. Fleets should always use a tire cage when inflating tire assemblies and they should never be bolted to the floor.

Employee training of technicians who work with tires and wheels is mandated by OSHA. It is the responsibility of the employer to assure that each employee demonstrates and maintains the ability to service tire and wheels safely. The employee must demonstrate the following tasks:

- Demounting of tires including deflation
- Inspection & identification of rim wheel components
- Mounting of tires including inflation with a restraining device (tire safety cage)
- Handling of wheels
- Inflation of a tire when a single piece wheel is mounted on a vehicle
- Understanding of the necessity of standing outside the trajectory both during inflation of the tire and during inspection of the wheel following inflation
- Installation and removal of wheels

OSHA is very clear that the employer must evaluate each employee's ability to perform these tasks. The employer shall provide additional training as necessary to assure that each employee maintains their proficiency with tires and wheels. OSHA will issue severe fines and penalties for accidents associated with tires and wheels. It is important for fleets to be very pro-active with their technicians that service tires.

Estimated Weights for Typical Tire and Wheel Assemblies	
Description	Est. Wt. in Lbs.
28/32" 295/75R22.5 Drive Tire	118
8.25" x 22.5" Aluminum Wheel	45
Total Assembly Weight	163
28/32" 11R24.5 Drive Tire	137
8.25" x 24.5" Aluminum Wheel	54
Total Assembly Weight	191
28/32" 295/75R22.5 Drive	118
8.25" x 22.5 Steel Wheel	76
Total Assembly Weight	194
28/32" 11R24.5 Drive Tire	137
8.25" x 24.5" Steel Wheel	85
Total Assembly Weight	222
27/32" Widebase 445/50R22.5 Drive Tire	182
22.5"x 14" Aluminum Wheel	54
Total Assembly Weight	236
27/32" Widebase 445/50R22.5 Drive Tire	182
22.5" x 14" Steel Wheel	127
Total Assembly Weight	309

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VOLUME 9 ISSUE 4

APRIL 2015



**P.S.I. By the
Numbers**
In the U.S.
92% of fleets
that use
automatic tire
inflation
systems
choose MTIS

Commercial Tire Pricing & Performance

Commercial tire pricing for both new tires and retreads has been fairly stable since 2012. We all recall 2011 when tire prices experienced a 50% average increase in prices. The tire manufacturers announced multiple price increases throughout 2011. Today, an owner-operator is paying approximately \$500 for a Tier 2 steer or drive tire. New over-the-road Tier 2 trailer tires are running about \$425. A trailer retread cap/casing for line-haul service comes in at \$190; when you supply the casing, the cap is about \$95.

Adding up all these costs, an owner-operator running all new tires on his line-haul 18-wheel tractor-trailer will spend \$1000 for two steer tires, \$4000 for eight drives, and \$3400 for eight new trailer tires. An \$8400 investment in tires is significant. Bigger fleets that buy in large quantities will obviously receive a better deal on tires, but it is still a substantial expense. Fuel efficient tires are now the latest trend and they typically have a 5-15% price premium.

The bottom line is that fleets and owner-operators all take tires very seriously and have similar objectives when it comes to getting the most from them by .. maximizing tire removal miles, reducing & eliminating tire irregular wear, maximizing miles/32", reducing cost/mile, and maximizing fuel economy/retreadability. Tire maintenance personnel understand that the least expensive tire may not be the best long term decision to the fleet's financial bottom line. Measuring tire performance in miles/32" is the best way to compare different tires. A less expensive drive tire may start out with 26/32" of rubber while the higher priced drive tire may have 30/32". Sometimes too deep a tread can cause tread lug squirm & excessive heat buildup which may lead to a faster overall wear rate. Tire design and

compounds play a major role in how the tire is going to perform.

Tire companies offer a wide range of tire products. It is always a good idea to dedicate X number of vehicles to evaluating various tire models. Some tire designs may work great on one specific vehicle make/model run in pure line-haul service while another may be the answer for the same vehicles running in more regional service. The Technology Maintenance Council of the American Trucking Association recommends thirty vehicles to do a statistically sound tire evaluation. Of course this is not always possible in the real world and really depends on your fleet size.

Loads, speeds, routes, and vehicle specifics all contribute to how a tire is going to perform. If you run an evaluation, keep in mind that tires mounted new during the summer months usually have a faster wear rate when compared to tires mounted in the middle of winter. There can be as much as a 10% difference in miles/32" between summer and winter.

The other key variable to tire performance is the driver. Studies over the years have shown that the driver can affect tire performance up to 35%. An aggressive driver that drives fast, makes hard turns, and is aggressive with the braking can make a significantly negative impact on tire wear. This is one of the reasons why owner-operators tend to generate higher removal miles and better miles/32" versus the fleet driver. Owner-operators purchase their own tires and understand how important it is to be easy on your vehicle and your tires.

Working with your tire professional is always a good idea before investing in commercial tires for your fleets.

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VOLUME 9 ISSUE 5

MAY 2015

Reducing Tire Issues

Have a Happy and Safe Memorial Day. Please remember all men and women who have died in military service to the United States.

This is the season for trucking industry conferences and expositions. It seems that every niche of trucking hosts their own annual convention. A common theme discussed at these events was tires and since they are still the highest maintenance cost for fleets, it's top of mind for many. A good, well thought through new tire and retread tire program can make a trucking company very successful.

During roadside inspections, tires are still in the top three of all violations found. Lights, brakes, and tires are consistently the biggest violators.

There are an estimated 4.5 million active drivers with a CDL. There has been and will continue to be a driver shortage so more and more fleets are hiring younger and less experienced drivers. Drivers have a major impact on tire performance. Industry studies have shown that drivers can adversely affect tire treadwear by up to 35%. Drivers that are aggressive in their driving skills tend to scrub the tread much more quickly off the tire. Quick acceleration and aggressive turning all lead to tire issues. Brake skids and tire flat spots are trending higher. Most of the time this is caused by the drivers. It is an education issue.

Less experienced drivers love to run into every curb with their right side trailer tires. The number one issue with the right outside dual tires are shoulder and sidewall impact breaks.

During the daily driver vehicle walk-around, the driver should be the early warning system when it comes to tires. Identifying tires with early onset of irregular wear, punctures, sidewall damage, low tread depth and underinflated tires can all be identified by the driver. At that point maintenance should be alerted and the problems corrected. With the CSA (Compliance, Safety, and Accountability) program run by FMCSA, drivers want nothing to do with vehicles that have tire issues because when they are pulled over for a roadside inspection and the inspectors find tire problems, then the driver also has a problem.

CSA assigns tires either eight or three points for a violation depending on the specific tire condition. The eight point violations will result in the vehicle put out-of-service. A good example of that is a flat tire. By definition of the CVSA (Commercial Vehicle Safety Administration), a tire is considered flat when the maximum tire pressure listed on the sidewall drops below 50%. So if a tire says the maximum pressure is 120 psi, when that tire drops to 60 psi or below, you would be assigned eight points plus the vehicle is put out of service. You cannot even drive to the next truck stop to find air. An expensive emergency roadside service call would be required. In addition, those eight points go on the fleet's CSA score and the driver's personal CSA score.

Bottom line is that tire problems lead to even bigger problems for both the fleet and the driver.

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Q&A PSI ANSWERS YOUR QUESTIONS

Q. What is the minimum legal limit for tread depth?

A. Steer tires have a legal tread depth limit of 4/32" while all other wheel positions (drive, trailer, and dolly) have a 2/32" target. If even one tire is measured during a roadside inspection to be less than the legal tread depth limit, the vehicle is considered out-of-service and requires an emergency roadside service call to replace the tire.

Troubleshooting Irregular Tire Wear

Marcus Jadotte,
Assistant Secretary of
Commerce for
Industry & Analysis,
International Trade
Administration, United
States Department of
Commerce visits P.S.I.



One of the most common issues facing trucking fleets is how to reduce and eliminate irregular tire wear. Tires with shoulder cupping, depressed ribs, heel-toe wear, fast shoulder wear, and just ugly-looking erratic wear will lead to premature early tire removals and will also kill your fuel economy. When tires are not running smoothly and evenly, fuel economy dramatically suffers.

So how do you determine the cause of irregular wear and whether it is tire or vehicle related? The following 10-question game will help you answer that.

1. **Q.** Is the irregular tire wear found on vehicles running in specific service vocations? **A.** Many times it is possible to isolate the irregular wear depending on specific service vocation. Maybe the tires with the shoulder cupping wear are running only on those linehaul trucks going from California to New York. Tires running in regional linehaul or pickup and delivery tend to scrub the rubber off faster and the result is that those tires have even wear.
2. **Q.** How many total vehicles are involved? **A.** If it's just a handful, then it is usually related more to a specific vehicle issue such as misalignment of the tractor and or trailer.
3. **Q.** Are all vehicles with the irregular wear the same make/model? **A.** There is often a direct correlation to unusual tire wear with a specific tractor or trailer make/model. This is very easy to determine.
4. **Q.** What is the specific irregular wear? **A.** If the trailer tires have developed overall erratic wear this is typically due to tires running underinflated. This condition disappears when spec'ing trailers with automatic tire inflation systems.
5. **Q.** What mileage did the irregular wear condition first appear? **A.** Try to determine if there is a correlation between mileage and when the irregular wear first became noticeable.

6. **Q.** Did the irregular wear occur on a specific tire model and size? What tire size and load range? **A.** One of the most important checks is to determine if the specific tire make/model is more sensitive and prone to irregular wear versus a different tire. Tires may appear to be black and round, but tire design and compound has an impact on resistance to irregular wear.

7. **Q.** Does the irregular wear occur on all wheel positions? **A.** If the irregular wear is found on the steer tires where both outside shoulders are wearing very fast, then that points to a front axle alignment issue. If the inside dual trailer tires have cupping and depressed wear, it is probably related to running those inside duals underinflated versus the outside duals.

8. **Q.** Is the irregular wear found on both new tires and retreads? **A.** Retreads will not have the same exact tread compound as the original tire. It is possible the retread design and compound selected is just more prone to uneven wear. If the irregular wear is exactly the same on both the new and retreaded tires, this points to a possible vehicle issue.

9. **Q.** What is the average load in pounds and at what tire pressure do they run? **A.** Air is what carries the load, so if the air pressure specification is too low for the load carried, irregular wear may develop.

10. **Q.** Does the fleet run fully loaded or do they run loaded and come back empty? **A.** The toughest scenario for tires is running fully loaded and returning empty. Since the tire pressure is always based on the worst case load scenario, coming back empty will lead to a small tire footprint especially on those trailer tires with the tire hopping as it goes down the highway. This leads to severe uneven wear.

These are the type of questions which need to be answered to get an initial handle on troubleshooting irregular wear. An excellent source of specific tire irregular wear troubleshooting is recently released Recommended Practice RP252 supplied by TMC of the American Trucking Association.

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VOLUME 9 ISSUE 8

AUGUST 2015

Greenhouse Gas (GHG) Emissions Phase 2 – Tires & Automatic Tire Inflation Systems

P.S.I. has
recognized
Wabash
National and
Utility Trailers
with Annual
Excellence
Awards



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Last month the Tire Digest discussed the June 2015 GHG Phase 2 Proposed Rule-making along with the associated updated Greenhouse Gas Emissions Model (GEM). The 1,329-page proposal is so detailed because it covers both tractors and trailers. It reviews different objectives/goals for various tractor and trailer configurations including linehaul and vocational service vehicles. The proposed rulemaking also includes different objectives depending on the tractor or trailer model year production.

The Greenhouse Gas Emission Model (GEM) allows vehicle producers to insert numbers for the assorted variables that will affect fuel economy and greenhouse gas emissions. Factors such as engine, vehicle configuration (6X4 versus 6X2), vehicle drag coefficient, vehicle weight reduction, low rolling resistance tires, and the use of automatic tire inflation all play a role in increasing fuel economy. As an example, the GEM model assigns a 1% increase in vehicle fuel economy if automatic tire inflation is spec'd on the tractor and 1.5% increase in fuel economy if tire inflation is used on the trailer.

Low rolling resistance tires are recognized as having an impact on vehicle fuel economy. The rulemaking notes on page 182 that differences in rolling resistance of up to 50% have been identified between tires of one make/model versus a different tire make/model. However, just because a tire is marketed as "low rolling resistance" does not guarantee the actual best fuel economy in the real world because not all tires are the same based on

the tread compound material, design and construction. It is important for fleets to do their own fuel economy testing to confirm results of specific tire models for their operation.

Low rolling resistance tires typically have a price premium attached because of the higher priced raw materials required to maximize fuel efficiency. Keeping tires properly inflated all the time is the only way to assure that these fuel efficient tires perform as expected. **Running a low rolling resistance tire underinflated eliminates any fuel economy benefit.**

Page 187 of the proposed rulemaking details information about automatic tire inflation systems. Proper tire inflation is CRITICAL to maintaining proper stress distribution in the tires, which reduces heat loss and rolling resistance. Tires with reduced inflation pressure exhibit a larger footprint on the road, more sidewall flexing and tread shearing, and therefore, have greater rolling resistance than a tire operating at its optimal inflation pressure. A ten psi reduction in overall tire inflation results in about a 1% reduction in fuel economy. To achieve the intended fuel efficiency benefits of low rolling resistance tires, it is critical that tires are maintained at the proper inflation pressure.

Tire pressure monitoring systems are also addressed in the rulemaking. TPMS notify the operator of tire pressure but require the operator to manually inflate the tires to optimum pressure. Because of the dependence on the operator's action, the agencies are not proposing to provide a reduction value for tire pressure monitoring systems.

Q&A PSI ANSWERS YOUR QUESTIONS

Q. I am spec'ing low rolling resistance drive tires on my tractor. Fuel economy is up almost 2% but my drive tire removal miles is down over 40K. Is this typical?

A. Many low rolling resistance drive tires have an initial tread depth several 32nds lower compared to the standard version (26/32 vs 30/32). In linehaul service each 32nd represents approximately 10 to 15,000 miles. This will account for your lower miles to removal.



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VOLUME 9 ISSUE 9

SEPTEMBER 2015

More about GHG- 2



17 Minutes:

The time you can save in CVSA Roadside Inspections when trailers have automatic tire inflation systems

In the previous two issues of the PSI Tire Digest we have addressed the new proposed rulemaking associated with the comprehensive proposed Greenhouse Gas Emissions updated proposal (GHG-2). The rulemaking will be implemented incrementally effective with model year 2018. Full implementation is not expected until model year 2027. One of the major components of the new rulemaking will be to include not only tractors but trailers for the first time. GHG-2 also includes a provision that could reduce the appeal of glider kits if the proposal becomes final.... The EPA is proposing to require that rebuilt engines installed in glider kits meet the emission standards applicable in the year of assembly, including all applicable standards for criteria pollutants.

When the proposed rulemaking was announced on June 19 this year the PDF document was an unwieldy 1,329 pages that likely has gone un-read by many. Since being published in the official Federal Registry, it's now only 700 pages in length, but don't be fooled - that's only because fonts have been reduced, all the content is still there.

Just about all types of trailers are included in the rulemaking except for some specialty trailers that see off road applications. Non-box trailers which include flat beds, tankers, moving vans, and chassis will be mandated to begin spec'ing low rolling resistance (LRR) tires and automatic tire inflation (ATIS) effective with model year 2018 which is realistically trailers produced anytime in 2017. For these trailers, LRR tires can add 3% or more to increasing fuel economy; and when you include automatic tire inflation, an extra credit of 1.5% is earned. Box trailers have many aerodynamic and fuel efficient options to increase vehicle fuel economy such as the use of trailer skirts, nose cones, LRR tires, tire inflation, wheel covers, and the use of reduced weight

materials in the trailer construction. Reducing trailer weight can be helpful in improving fuel economy for those fleets who typically cube out on loads and when trailers are empty on a backhaul. It is a fact that properly inflated tires will make all other aerodynamic devices, LRR tires and weight reduction efforts work to their potential to insure GHG-2 will be a successful program.

During August this year, the EPA has held two public hearings to hear comments directly from the public and stakeholders addressing the proposed rulemaking. In Chicago and again in Long Beach, California the hearings were well attended. A plethora of people representing environmental groups feel very strongly that the proposed rulemaking should be more stringent and implementation dates moved up. These folks want the government to do everything in its power to help clean up the environment and reduce greenhouse gas emissions. It is interesting to note that the lengthy introduction of the new rulemaking documents and describes how 97% of the world's scientists agree that global warming is a serious man-made issue that needs to be taken very seriously. They believe the results of not doing everything we can to clean up the environment will result in serious issues for future generations.

Interested parties have until October 1, 2015 to comment on the proposed rulemaking. Here is the link to submit your comments.

<https://www.federalregister.gov/articles/2015/07/13/2015-15500/greenhouse-gas-emissions-and-fuel-efficiency-standards-for-medium--and-heavy-duty-engines-and>

There have been 182 comments posted online regarding the proposed regulation as of September 8, 2015. You can view all of these comments at:

<http://www.regulations.gov/#%21docketDetail;D=EPA-HQ-OAR-2014-0827>

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Winter Tire Program



Figure 1

For commercial tires, fall is the best time to insure winter tire programs are completely up to speed. Vehicle traction now is especially critical from both a driver and safety standpoint. Tires with tread depth near the legal limits of 4/32" for steer tires and 2/32" for all the other wheel positions do not have the same level of traction as tires with full tread depth. Fleets that run rib tires in all wheel positions may have success in good weather but will be at a clear traction disadvantage in the drive wheel position during winter. Selecting tread patterns with lugs will increase drive tire traction dramatically under snow and slushy conditions.

It is important to do a serious inspection of tires prior to winter. This involves:

- Measuring tread depth in multiple locations around the tire circumference
- Checking for signs of irregular wear
- Identify & repair any punctures
- Verify casing age
- Check sidewall appearance for signs of impact breaks and ozone cracking
- Rotate tires as required

Let's address these 6 points.

A common mistake when measuring tread depth is to use a tread depth gauge and obtain a tread depth reading at one random location on the tire. This can be very misleading as tires are not always wearing evenly across the tread (from shoulder to shoulder) and also circumferentially around the tire. Tread depth measurements should be taken at each major groove across the tread at point A and then take the same measurements 180 degrees away from point A. Many tires have stone ejectors at the bottom of the major grooves. It is important to NOT measure tread depth on a stone ejector as the measurement will give you an in-

accurate low reading of approximately 2/32". It is also important to insure that your tread depth measuring device is calibrated. Easiest check is to confirm that the tread depth shows 0 when measuring on a flat surface. (See figure 1).

To maximize treadwear & fuel economy requires that the tire is running smoothly and evenly. Running your hand across the tread surface (commonly known as fingertip diagnostics) along with a visual inspection will confirm that the tire is running uniformly. If there is shoulder cupping, depressed ribs, alternate lug wear, or other signs of irregular wear, then there is typically an issue with the vehicle or the tires themselves. It may be vehicle alignment related, underinflated tires, running overloaded, or running fully loaded going out and empty coming home.

Truck tires have a propensity to pick up puncturing objects. Checking for tire damage and punctures 360 degrees around the tire is important to insure that you minimize tire related roadside service calls.

Most fleets have targets when it comes to tire casing age. It may be six years or even ten years but fleets should have a number based on historical tire performance retreadability data. Tire casing age can be easily identified through the last 4 digits (month/year) of the DOT code found on one side of the tire.

Use fingertip diagnostics to check the sidewall for undulations and visually look for signs of impact damage and cracking.

Based on the measured tread depths, it may be time to rotate the worn steer tires back to the trailer position and generate additional mileage. Some fleets even rotate drive tires especially in pickup and delivery operations where the rear drive axle tires can wear out significantly faster than the front axle drive tires. When vehicles turn frequently in city applications, the pivot point is the first drive axle and the rear axle tires tend to scrub the tread rubber off very rapidly.

The bottom line is that fleets need to review their tire program to insure that tires are in good shape going into the winter season.

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Tracking your Tires: What's Important

After fuel, tires are the number one maintenance cost for commercial fleets. The average cost of a new commercial tire is about \$500 depending on tread depth, compound, and wheel position. A typical eighteen wheeler running new rubber on both the tractor and trailer has an investment in tires that can exceed \$9,000.

This is a serious cost outlay, so it is important for fleets to keep a close eye on how the tires are performing. The key metrics to monitor include:

- Miles/32"
- Removal miles
- Casing retreadability
- Tire pressure

Fleets that attempt to track every tire in their fleet from birth to death over multiple retreads finds this to be an impossible task. It takes way too much time and effort to record mileages, tread depth, tire pressures, and tire identification numbers of every tire running in your fleet. Plus there is extra effort required to record every event that happens to a tire such as puncture damage, rotation, and running out steer tires on the trailer position. In addition, there is entry error in trying to physically record the information into a database.

TMC, the Technology & Maintenance Council, of the American Trucking Association recommends tracking a statistically valid sample size. This is much more practical, and you can extrapolate the tire data for your entire fleet from the results of your sample group. TMC recommends thirty as a sample size to be statistically relevant. However, for many fleets this number can come close to or exceed the total vehicles in the fleet so should be revised to a number that would be manageable and still large enough to get good information. Tracking

tires for the sample group for each of your specific service vocations will tell you everything you need to know about how your tires are performing. There is software available in the market to enter and track tire data. Many fleets simply create an XLS (Excel) database where the data is entered.

Once the tire data has been entered into some sort of database, you can start to analyze it. You can look at many different scenarios; for instance how one tire model is performing on the drive position versus how another is performing on vehicles running in line haul service. This will involve determining treadwear measured in miles/32" for each tire and also actual tire removal miles. Once the results are viewed, you may want to drill down further to determine if a certain tire is performing better or worse on different vehicle models. A similar analysis can be performed on any retreads running in your fleet. Casing retreadability is an important consideration for most fleets. If two retreads per casing is your target and your analysis shows that a particular tire model only averages 1.2 retreads per casing, then it is probably time to make a change.

Some tire designs may be more prone to irregular wear and tire punctures when compared to other designs. Once the tire data is entered into a database, it is amazing how much information can be learned that can help your fleet make the best possible business decisions regarding your tires and your tire program.

It is always a good idea to work with your local tire professional to help you enter, track the appropriate tire information and analyze the results. Your local tire representative can also provide insight into what other fleets in similar service vocations are doing with their tire programs to maximize tire performance and reduce costs.

Q&A PSI ANSWERS YOUR QUESTIONS

Q. I have read about the new Greenhouse Gas Phase 2 regulations? When does it go into effect?

A. The new Proposed GHG-2 rulemaking is scheduled to be announced sometime in the middle of 2016. The comment period ended October 1, 2015. It will take effect for both tractors and trailers effective with model year 2018.

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