

## COMMERCIAL FLEET TIRE DIGEST

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# 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 6 ISSUE 1

JANUARY 2012

## Minimizing Irregular Tire Wear

Obtain a copy of  
*Radial Tire Wear  
Conditions &  
Analysis Guide*  
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Default.aspx](http://www.atabusinesssolutions.com/ATA/ATAProductDetail/tabid/274/productid/5281/Default.aspx)

The goal of every fleet is to maximize tire removal mileage. When irregular wear develops on your tires, the result is premature tire removal which directly hits the tire budget. Tires that are run in city type pickup and delivery service tend to scrub the tread rubber off quite rapidly and do not see the frequency of irregular wear compared to tires that are run in slow wearing line haul service. Treadwear measured in miles/32" may be in the 5,000 miles/32" range for a tire that sees city service turning conditions. The same tire design which is running in a straight line from coast to coast with very little turning may see 15,000 or even 20,000 miles/32".

Today's radial truck tires generate many, many miles prior to removal, especially in line haul service. Steer tires commonly see over 150,000 miles, drive tires 300,000 – 350,000 and trailer tires over 200,000 miles to removal. The caveat is that the vehicles must be well maintained, are in proper alignment, and the tires must be running at the specified air pressure all the time.

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So what causes irregular wear? Irregular wear patterns are caused by abrasion in one specific area of the tire footprint instead of a nice distribution across the entire tread surface. Examples of how this happens would include side forces created by too much toe (alignment), tires out of balance, brake skids, and slipping the tire across the pavement during a turn. Some tire designs may be more susceptible to vehicle misalignment and reduced tire pressures. Every time a tire lands in a specific spot on the footprint, the tire will wear faster there.

Even a fleet with a great tire program cannot always control irregular wear because of the many sources of the problem.. It has been well documented as to what are the main culprits of irregular wear:

- Alignment
- Equipment maintenance
- Service vocation
- Improper tire maintenance
- Road hazards
- Tire manufacturing

Vehicle alignment is likely the number one and most common cause of early tire removals. Full & fast shoulder wear, one sided wear, and feather wear are all related to vehicle misalignment. It is rare that trailers are regularly checked for alignment and as a result, trailer tires generate a very high amount of early tire removals due to irregular wear.

Equipment which is poorly maintained and may have worn shocks, worn & bent suspension components, and misadjusted air bags all contribute to irregular tire wear. Depressed ribs and lugs, alternate lug wear and rapid shoulder wear can be attributed to poorly maintained equipment.

Failure to have a serious tire program of course will lead to irregular wear. Low tire pressures, unbalanced tire & wheel assemblies, failure to match dual tires will all lead to early tire removals. Cupping and heel/toe wear are signs of tire maintenance issues.

The TMC of the American Trucking Association publishes the premier guide to tire irregular wear and how you can identify the specific cause. The Radial Tire Wear Conditions & Analysis Guide is a must for every fleet.



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VOLUME 6 ISSUE 2

FEBRUARY 2012

## Why the Fuss about Underinflated Tires?

To read  
Jim Park's blog  
about under  
inflation, go to  
[http://  
truckinginfo.com/  
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detail.asp?  
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ews\\_category\\_id=1  
24](http://truckinginfo.com/on-the-road/detail.asp?news_id=75672&news_category_id=124)

Have you ever tried to ride your bicycle on the park trail and it becomes harder and harder to pedal even on the straight-away? When you put your grandkids in the red wagon and it requires a lot of effort turning in circles around the driveway, do you ever think about why it is so difficult to pull the wagon? A recent article found in Jim Park's blog on Truckinginfo.com (web site of Heavy Duty Trucking magazine) spoke about Jim's motorcycle with a tire pressure of only 10 psi (spec was 28 psi). The motorcycle barely rolled down the driveway and it labored in first gear. Could one low tire cause him such grief? The answer was a loud yes. After inflating the tire back to 28 psi, he could not believe the improvement in how the motorcycle drove down the road. Tim Miller from Goodyear in the same blog was quoted as saying "driving on soft (low) tires was like walking bare-foot on a beach with deep sand, pushing the shifting sand aside with your foot requires energy & that is why your legs get tired".

The increase in tire rolling resistance is directly correlated with lower fuel economy. As diesel prices hover in the \$4.00 per gallon range, even a one or two percent drop in fuel economy due to underinflated tires will have a serious impact on your tire budget.

The only time an underinflated tire is a good thing is when you need a lot of traction. The load/inch is distributed over a greater area because of the longer tire footprint. As an example, when military vehicles are running in the hot, sandy desert, the tire pressure is lowered to get much needed traction. The only caveat is that when the pressure is lowered, you can no longer be driving at high speeds because of the extra heat generated by sidewall flexing.

Maintaining your tire pressures at the correct specified pressure all the time is the key to maximizing removal mileage and fuel economy. Manual tire pressure checks with a calibrated pressure gauge is one option but you can check your tires in the morning and then run over a nail ten minutes after you pull out of the terminal, lowering pressure immediately. The best option for those neglected trailer tires which typically have the worst air pressure is to use a tire inflation system which adds air automatically when the tires drop below the pressure set in the control box.

Working with your tire professional is key to implementing a serious tire inflation program for your fleet.

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When tires are run underinflated, the tire rolling resistance increases significantly because there is a lot more rubber on the road. A truck tire footprint increases 18% in length when underinflated 30%. That increase in rolling resistance is why those low bicycle, wagon, and motorcycle tires were all so difficult to navigate with underinflated tires.

### Q&A PSI ANSWERS YOUR QUESTIONS

**Q.** I recently purchased new tires that were built overseas. I noticed that several of the tires had the "DOT" letters molded into the tire sidewall but there was no actual number following the DOT letters. What should I do?

**A.** Any tire that is run in this country must have a DOT number molded into the tire sidewall by law. Not all countries require such a stamping. Our guess is that the tires you have purchased were not intended to be exported into the United States. You should return those tires back to your point of purchase.

## Tires and Your Vehicle Odometer/Speedometer

Annual Fleet  
Technology  
Event, San  
Antonio, TX  
April 10-11;  
email  
[al.cohn@psi-  
atis.com](mailto:al.cohn@psi-atis.com)  
for more  
information

Every tire manufacturer publishes an RPM (revolutions/mile) value associated with a specific tire make/model and size. When you purchase a new tractor, the vehicle's odometer & speedometer has been calibrated based on the drive axle tire's RPM. However, as the tire wears down, the RPM's increase and the odometer/speedometer will not be indicating the exact actual mileage. This same issue occurs if you decide to change tire sizes.

Let's take a closer look at these 2 scenarios. If you decide to make the move from a low profile drive tire 295/75R22.5 size which is 41.1" overall diameter to a standard aspect ratio 11R22.5 with a larger 42.4" overall diameter, the odometer will be reading too low. The speedometer will be reading a lower speed than you are really traveling. The result is a potential for some serious speeding tickets.

When you take a new drive tire with 30/32" initial tread depth and wear it down to 6/32" tread depth (typical pull point for truck tires) the odometer will be too high. The speedometer will be reading a higher speed than you are really traveling and will take longer to get to your final destination.

Over the years there have been people who literally roll a tire for a 100 yards and then determine (prorate) what is the actual RPM. They always get the incorrect answer from the published value. Why, because they did not take into account the amount of compression that occurs based on the rated tire load/inflation as well as the dynamic effect of running at 65 mph. Just rolling a tire for a mile will give you a much higher RPM versus actual.

Most 295/75R22.5 drive tires with 30/32 initial tread depth are in the range of 508

RPM's with an overall diameter of 41.1". That same tire with 6/32" tread depth means that 24/32" was worn off. To find out what the worn tire diameter is you would take the 24/32" and multiple by 2. 48/32" has been worn off which is = 1.50".

$$41.1" - 1.50" = 39.60" \text{ worn tire diameter}$$

When the worn tire has a diameter of 39.60", the actual tire RPM would be 41.1/39.60 times 508 RPM.

When you do the math the worn tire RPM = 527 RPM

The worn tire is rotating 3.7% more revolutions per mile versus the new tire (527 RPM versus 508 RPM when new).

This 3.7% variation in RPM between a new and worn tire is actually on the high side. As the tread rubber wears down, the actual casing "grows" slightly in overall diameter. It is difficult to measure this actual growth but it does tend to slightly offset the increased tire RPM as the tread wears. The rule of thumb is the smaller the tire overall diameter, the lower the speed for a given RPM. The good news is that you will not be getting any speeding tickets. Bigger tires or tires with a larger overall diameter get there faster but you will become a revenue generator for local law enforcement.

The solution for many fleets is to calibrate their tractor speedometers or hubodometers with tires that are 50% worn. It is a good compromise.



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## How to Stretch Your Tire Budgets

Learn more  
about  
SmartWay  
at  
[http://  
www.epa.gov  
/smartway/](http://www.epa.gov/smartway/)

After attending the March MidAmerica Trucking Show in Louisville, Kentucky, it was obvious that the continued escalation in the prices of commercial truck tires have fleets very concerned about their tire budgets for 2012. Fleets are looking for ways to maximize tire removal miles and retreadability of the casing; and reducing tire related roadside service calls is critical to improving a tire budget. Of course, maximizing vehicle fuel economy is a goal of every fleet, both big and small, and one way to do that is to purchase low rolling resistant fuel efficient tires. On the EPA SmartWay website, there are over one hundred specific tire makes/models which are on the "verified" technology list to help improve fuel economy. To make the verified SmartWay list a tire must show a three percent or greater improvement in fuel economy.

If your fleet is currently averaging 6.0 miles/gallon with your current tire lineup and you switched to fuel efficient tires which had a three percent fuel economy improvement, your new miles/gallon would be 6.18. It does not sound like very much until you do the math which would show you just how much a year you could save in fuel costs.

Let's use the example of a ten-truck fleet in linehaul service averaging 100,000 miles per year per truck. At 6.0 mpg, each truck would consume 16,667 gallons of fuel per year. If the cost of diesel was only \$4.00 per gallon, the fuel bill per truck is \$66,667. But now through the purchase of fuel efficient tires, at 6.18 mpg, each truck would only consume 16,181 gallons of fuel per year. A savings of 486 gallons equates to a savings per year per truck of \$1944. For the entire fleet of ten trucks, you are looking at a yearly fuel savings of \$19,440. This sav-

ings will go a long way in offsetting the tire price premium of five to ten percent to purchase fuel efficient tires. So even though the tire budget will increase to purchase fuel efficient tires, the savings in the fuel bill will significantly help the overall costs in running your vehicles. All tire manufacturers offer low rolling resistant tires with a premium price tag – to get the most value from these more expensive tires, maintaining proper inflation is more important than ever.

The key to maximizing tire removal miles is to insure that your vehicles are in alignment and running at the correct pressure all the time. Driver morning vehicle walk-arounds are a great way to identify tire issues. It is an early warning system to minimize irregular wear and detect sidewall snags and finding punctures. Even though a vehicle may have a tire pressure monitoring or automatic tire inflation system that does not mean that you should not be inspecting your tires and checking them with a calibrated air pressure gauge on a regular basis. If a tire's air pressure is found to be twenty percent or more underinflated, that tire should be dismantled and thoroughly inspected to determine the cause of the low tire pressure.

Training your drivers about tires is great way to help keep your tire budgets in line. It is an ongoing training, not just the day the driver hires into your fleet.

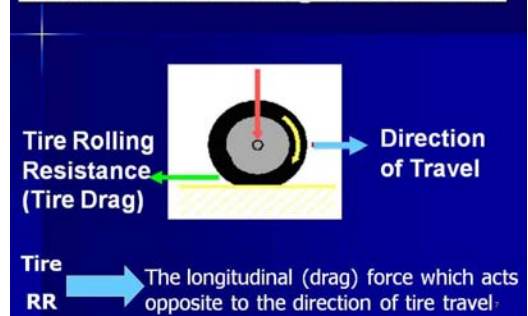
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### What is Tire Rolling Resistance?





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VOLUME 6 ISSUE 5

MAY 2012

## Measuring Tire Pressures - Issues & Pitfalls to Avoid

To get a printed volume of all 2011 Commercial Fleet Tire Digest issues go to [www.psitiredigest.com/archive.html](http://www.psitiredigest.com/archive.html)

What is your fleet's tire pressure specification? What is the actual measured tire pressure? What was the ambient temperature when the tire pressure was checked? Was the pressure gauge used to check the tire pressure properly calibrated? Was the tire pressure measured when the vehicle just came off the highway? These are the types of questions that need to be asked, and answered, as part of a serious fleet tire program.

Many fleets choose one tire fleet specification regardless of wheel position. The idea is to make it simple for the mechanics and tire busters in the shop who will only need to recall one pressure specification. But, the flip side is that the recommended tire pressure specification should be based on the worst case load scenario depending on the specific axle. This will give the optimum tire footprint leading to the best possible removal mileage with minimal irregular wear. Many fleets do have different tire pressure specs for tires running on steer, drive, dollie, and trailer wheel positions and that is likely to give the best results. Installing pressure decals on each vehicle with these specifications will aid the drivers, mechanics, and road service providers in insuring that the tires are aired up to the fleet's recommended tire pressure.

Every tire manufacturer publishes a tire "load/inflation table" that is easily downloadable at their respective web sites. These tables give the recommended pressure for both single and dual tires at a full range of vehicle loads. The higher the load, the higher the tire pressure will be to support that load.

Every tire has a maximum load at a specific tire pressure molded into the tire sidewall. This, however, is NOT the recommended pressure for your operation. It is the heaviest load that the tire was designed to support at a specific tire pressure. As a fleet you cannot legally exceed these numbers.

The pressures listed in the load/inflation table are based on tires at an ambient temperature of 70° F. The rule of thumb is that every 10° F equals two psi. So what does that mean? If the fleet spec is 100 psi at 70° F and you are mounting a tire outside where it is currently only 20° F, you should inflate the tire to 90 psi. If the vehicle was brought back into the shop where the temperature is 70° F, the tire will jump back up to 100 psi within an hour.

Checking tire pressures with a calibrated air pressure gauge is a big issue these days. The common stick type gauges are just not very accurate. The spring stiffness changes with temperature affecting the pressure reading. In addition, you just hope that the plastic or metal stick with the numbers is positioned properly into the spring to begin with. Dropping a gauge a few times on hard concrete will make matters even worse.

The last important factoid is that you should never check a hot tire that just came off the highway. It takes many hours to cool back down to ambient temperature. Tires typically gain about 15% in pressure running fully loaded at 65 -70 mph. The issue is that you do not know how long the vehicle has been sitting in the yard prior to checking the tire pressure. And of course, if the sun was beating down on the right side tires, they will be at a higher pressure than the left side tires which are not in the sun.

Understanding the basics of tires and pressure will go a long way in developing a serious tire pressure management program.

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VOLUME 6 ISSUE 6

JUNE 2012

## Why Do My Tires Lose Air?

**Air loss in tires can be affected by a variety of reasons including the quality of the materials used in manufacture, simple osmosis, punctures and issues with the valve stem**

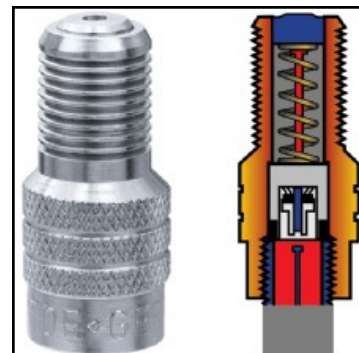
With all the rubber and steel that goes into the manufacture of a commercial tire, one would think that the air molecules would take a really long time to migrate out of the tire. Tires may all look black and round but they can be produced with a wide range of materials that may affect not only how a tire performs for treadwear and traction, but also how the air is trapped inside the tire and wheel. The first line of defense in trapping air inside the tire is the tire innerliner compound. Butyl based rubber compounds are typically used by the tire producers to minimize the osmosis of the air to the outside of the tire. There are many options when it comes to innerliner gauge. Heavier innerliner gauge will help reduce the osmosis but comes at a weight and price penalty because the butyl based innerliner compounds use higher priced materials. The actual rubber that is used is commonly chlorinated and/or brominated which improves the barrier compound making it harder for the air to escape.

However, even the best tires will lose 1 - 2 psi per month simply through osmosis. This does not sound like very much until you put it into proper perspective. A truck tire may be inflated initially when it goes into service to 100 psi, but a year later, it could be 85 psi or lower. Tires will run a lot hotter at low air pressures and the footprint becomes longer leading to high rolling resistance and bad fuel economy, so your tire program should ensure that psi is maintained at the optimum pressure as regularly as possible.

Another major reason why tires lose air is nail punctures in the tread area. These are typically slow leakers but still you can now be losing 1 - 2 psi or more per DAY instead of losing 1- 2 psi per month. Just because you checked all the tire pressures in the morning does not mean that you can't pick up a puncture just driving out of the terminal. Slow leaking nail punctures are very common when you consider the road conditions and especially conditions in the areas where you go to drop off a load.

Another major contributor for tires losing air is the tire valve. Standard valve caps which help protect the valve core from air leaks may easily go missing. There are non-removeable alligator flow-thru valve caps available that cost a little more, but since they are not taken on and off, there is little chance of losing them. Over tightening Schrader-type valve cores beyond the recommended 4 inch-pounds can also lead to air leaks. Tire supply companies sell a pre-set torque tool for this purpose. Anyone responsible for tightening the tire valve should have one.

Working with your tire professionals to insure you have a serious tire pressure program is one of the best ways to maximize tire mileages, improve fuel economy, and insure your vehicle is not out of operation waiting for a tire related roadside service call.



Inflate-thru Alligator Valve from Myers Tire Supply

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Euro-Team at the  
World Truck  
EXPO, IAA Show -  
Hall 26, Booth E03  
-  
Hanover, Germany  
September 18  
through 26, 2012  
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Mike, Angel,  
Christophe and  
Frank

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VOLUME 6 ISSUE 7

JULY 2012

## Widebase Tires - What's the Verdict?



*Thanks to our  
troops serving  
around the  
world for  
protecting our  
independence  
and freedom !*

Believe it or not widebase tires (two dual tires replaced by one tire) have been on the market for more than ten years with sales doubling each year since their introduction. If industry sales growth is any indication then widebase tires have been a clear innovative winner.

Michelin, Bridgestone, Goodyear, Continental all currently offer a wide array of both drive and trailer widebase designs in both the 445/50R22.5 and 455/55R22.5 sizes. The 445/50R22.5 is the most popular size with over 70% of the widebase market. The larger size widebase (455/55R22.5) has 800 pounds per tire higher load capacity versus the 445/50R22.5. The 455/50R22.5 is rated at 11,000 pounds with 120 psi inflation pressure.

Approximately 70% of the widebase tires sold today are for the drive axle position with 30% of the tires purchased for trailers. Widebase tires are being used more and more on dollies because these tires allow one individual to manually move a dolly into position in the yard much more easily than he can when the dolly is equipped with duals.

So what makes these widebase tires so attractive to fleets? Significantly reducing the number of tires in inventory is a nice advantage because it reduces inventory carrying costs. And of course you only require half the number of wheels, so you reduce that inventory as well. If you are a fleet that grosses out your loads, then widebase tires on both drive and trailer positions will allow you to gain between 800 – 1000 pounds of load capacity assuming you are now running aluminum in place of steel wheels. The next big advantage is vehicle fuel economy. One wide-

base tire is NOT double the size or weight of two duals. A widebase tire equals approximately 70% of the footprint width of two duals. Running one widebase in place of two duals will produce a significant reduction in rolling resistance resulting in better fuel economy.

Another advantage to fleets is that drivers just like the way a vehicle equipped with widebase tires runs down the highway because these tires are NOT affected by road rutting in the same way that duals are. Ask any driver and they will tell you they prefer to drive a vehicle equipped with widebase tires. With driver shortages expected to worsen, this may make a world of difference to your fleet.

While there are many advantages, there are also a few considerations when specing a vehicle with widebase tires. Mechanics and tire busters are dealing with a much heavier tire assembly (versus one dual) that requires special handling equipment and a good handling technique. Maintaining the required air pressure is really critical for these tires. A widebase tire underinflated even 10% will cause excessive sidewall flexing and high heat generation. One widebase tire is doing the work of two duals and is working very hard which is why maintaining proper air pressure is so important. If a widebase tire goes flat there is no limp-home capability to the next truck stop which is why the use of automatic tire inflation systems is pretty much standard for those fleets that are running widebase tires on their trailers.

Now that you know some of the advantages and disadvantages of running widebase tires, you'll be able to decide which is best for your particular application. Contact your tire vendor to get additional information on their widebase tire offerings.

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VOLUME 6 ISSUE 8

AUGUST 2012

## The Future is Now

PSI has written a  
White Paper  
about tire infla-  
tion and heavy  
duty tire  
care. You can  
download a copy  
at  
[www.psitiredigest.com](http://www.psitiredigest.com)  
/[PSI Tire Inflation](#)  
[White Paper.pdf](#)

In many of the Tire Digest issues we talk about how tires can influence fuel economy because we understand that reducing your fuel consumption is very important. The subject of this month's article will give you a look at what's possible when you are considering ways to really move the needle where fuel economy is concerned.

The AirFlow BulletTruck is not just a futuristic model but a fully operational long-haul truck moving freight right now. Bob Silwa, President of AirFlow Truck Company has set a goal to produce the most fuel efficient commercial vehicle anywhere by building a complete tractor trailer integrated system, utilizing innovative aerodynamic designs and materials. Bob has been a trucker and for years was tweaking his own rigs to get the best fuel efficiency before he founded AirFlow Truck Company. Now he's moving freight coast to coast, making money and on a recent trip of 3043 miles he averaged 13.4 miles per gallon while running against 35 MPH headwinds through Wyoming and 40 MPH crosswinds in Utah.

How does he do it: The answer is he uses advanced 21st. century computer-aided-design aerodynamics, light weight modern materials and assembly, and innovative but practical solutions to common problems. Solutions Bob has incorporated include:

- The 450hp Cummins ISX engine is only operated between 1100-1250 rpm all day long. Cruise speed is set at 55 mph and at that speed, the engine is turning 1225 rpm
- The use of a full-sized ducted radiator hidden underneath an extremely aerodynamic body.
- A hybridized A/C compressor and a re-engineered drive belt system greatly reduce diesel engine parasitic losses and emissions and increases fuel economy.

- A 9" high-definition monitor that sits directly behind the steering wheel ties directly into the engine computer. The video panel provides important engine feedback and is used by the driver to monitor the engine precisely for world-record fuel economy.

Besides Bob's own pioneering ideas, he has partnered with many industry manufacturers who are making products that through their own development reduce fuel consumption - by reducing weight, improving aerodynamics or in the case of PSI, keeping tires inflated to the appropriate pressure which always maximizes miles per gallon. In addition to using the standard PSI system on the trailers, he also made a modification to also use it as an external system on the tractor's drive tires. We've pointed out in the past that any reduction in air pressure increases the tire footprint and therefore its rolling resistance, and so it's directly correlated with lower fuel economy. Now that Bob is out on the road, having an automatic tire inflation system on the rig has helped him in not only keeping tires inflated properly but twice the system has allowed him to re-inflate a flat on the road so he could keep moving the freight he was hauling without adding unproductive time to his trip.

When you're not encumbered by thinking "that won't work", you can try ideas in your own fleet or make suggestions to manufacturers that may ultimately set a reasonable goal of double digit mpg for the commercial vehicle industry. See what's possible at [www.airflowtruck.com](http://www.airflowtruck.com)



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VOLUME 6 ISSUE 9

SEPTEMBER 2012

## Tire Budgeting Process

Visit the PSI Euro  
Team IAA  
Commercial  
Vehicle Show in  
Hannover GR,  
Sept.19 -28,  
2012 Messe Hall  
26 Booth #E03  
The Worlds  
Largest Trucking  
Event

Planning your annual tire related budget can be a complicated process and takes considerable time when you take into account the many variables that go into a realistic budget. It is not simply the cost of new tires and retreads. A good industry reference on this subject is Recommended Practice 208D from the TMC (Technology Maintenance Council) of the American Trucking Association.

For your tire budget, new tires can be broken down into three categories:

1] Tires that come equipped on your new tractors and trailers. 2] Replacement tires that are purchased on a regular schedule as well as those bought on the road because of tire puncture/damage. 3] Retreads which are typically purchased as replacements and on the road with different costs depending on whether you retread your own casing or purchase a cap/casing. Most fleets prefer if possible to retread their own casings since they know the history of that particular casing.

Repairing tires must also be included in your budgeting process. Time, labor and cost of repair materials can take a toll on your tire budget. Road service calls have always been a serious cost for fleets. Not only is the road service call itself expensive, especially for those occurring after normal business hours, but the downtime associated with a road service call is also significant. The average roadside service call takes about two and half hours. With so many fleets in a just-in-time delivery mode, this downtime can result in a hefty penalty associated with a late delivery.

Labor connected with tires includes mounting, dismounting, balancing, and rotating tires. Every fleet has different labor costs depending if they are doing this in-house or outsourcing to a local tire dealer. Even within a fleet, costs can vary because mounting/dismounting a 11R22.5 tire takes less effort and time versus doing the same procedure on a widebase tire such as the 445/50R22.5. All these variables should be taken into account when designing your tire budget.

Determining an average removal mileage for your tires is required to give a good estimate of the actual number of tires your fleet will be purchasing every year so you can budget accordingly. The removal miles will be different depending on specific axle. Steer tires running in line haul operations may average 175,000 miles, drive tires could be 300,000 miles, and new trailer tires may be averaging 200,000 to removal. Retreads will have different removal mileages. Since you already know the average miles run on the tractors and trailers in your operation, it will be straightforward to determine how many tires will be coming out of service each year depending on wheel position. These numbers change dramatically for vehicles run in different service vocations. If half of your tractors are in line haul operations and the other half in more pickup and delivery service, then two separate calculations would be required.

The more operational variables in your fleet, the longer it will take to accurately put together your annual tire budget. Working with your local tire provider will also be helpful in the process.

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VOLUME 6 ISSUE 10

OCTOBER 2012



Don't get  
Tricked by  
Underinflation,  
Treat Your Fleet  
to Automatic  
Tire Inflation  
Systems

## Trailers and Aerodynamics

With diesel fuel prices hovering in the \$4.00 per gallon range and higher, fleets are taking a closer look at improving trailer aerodynamics to improve overall vehicle fuel economy.

Some of the many aerodynamic and fuel improvement products on the market for trailers include:

- Side skirts
- Undercarriage products
- Low rolling resistance tires
- Rear door fairings
- Fairings for gap between tractor and trailer
- Automatic Tire inflation Systems

The California Air Resource Board known as CARB, an extension of the California EPA, has issued its Greenhouse Gas Emission Reduction Regulation for Tractor-Trailers effective January 1, 2010. The regulation affects all 53' van and reefer trailers that travel in California regardless of where the vehicle is registered. A fleet can reduce greenhouse gas emissions by improving fuel economy.

For new trailers, the CARB regulations state that the trailer must be "SmartWay" verified OR retrofitted with SmartWay verified technologies. SmartWay verified technology must include low rolling resistance tires and at least one verified aerodynamic device. The other caveat is that whatever you choose, you must show a 4% improvement in fuel economy for reefers and a 5% improvement for dry van trailers. Used trailers must also meet

these standards in California by January 1, 2013.

It has been well documented through wind tunnel testing and actual field testing that the combination of low rolling resistance tires and trailer aerodynamic devices will indeed improve vehicle fuel economy. The return on investment calculation involves not only the price premium for low rolling resistance tires but also the added cost of any aerodynamic device. For the aerodynamic devices, there is also the labor involved to install them on existing trailers, and the ROI would also include the cost of maintaining them because of road damage. They work best under highway speeds but not as much in pickup and delivery service operating in slower city driving conditions.

Low rolling resistance trailer tires on their own can improve fuel economy approximately 3% or more. The key (crucial) point regarding these tires is that the fuel economy advantage will disappear if the tires are not run at the specified air pressure ALL the time. The added expense associated with low rolling resistance tires will be negated by underinflation. Trailer tires always have the poorest maintenance and have a poor track record for proper inflation since trailers are not seen nearly as often as the tractors.

Automatic tire inflation systems for trailers continue to remain popular not only for significantly reducing tire related roadside service calls but to maximize fuel economy and subsequently to reduce greenhouse gas emissions.

## Q&A PSI ANSWERS YOUR QUESTIONS

- Q.** I am confused regarding the new CSA regulations regarding 8 points when a tire is flat?  
**A.** CSA uses the CVSA (Commercial Vehicle Safety Alliance) definition of a flat tire which is 50% or less of the maximum pressure molded onto the tire sidewall. If the maximum pressure for a specific tire design is 120 psi, then if the tire is measured to be 60 psi or less, it would be subject to an 8 point CSA violation along with the vehicle being put "out-of-service" until the tire is back to spec pressure.

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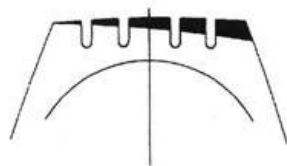
## Trailers Tires and Alignment

**Happy Holidays**  
from everyone  
at  
**PSI and  
Commercial Fleet  
Tire Digest.**

**May you and  
your  
family have a  
joyous holiday!  
season.**

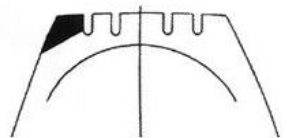
Trailer tires typically have many issues with fleets. They are not inspected very frequently and tire pressure checks are rare. A trailer found to be out of alignment will have a negative impact on both tire removal mileages and fuel economy. The payback for doing a trailer alignment is very short when you take into account the cost of fuel and tires. So what type of tire wear conditions would be a sign that trailer alignment may be an issue?

There are two specific trailer tire wear patterns associated with misaligned trailers. One-sided wear and fast or rapid shoulder wear on one shoulder.



One Sided  
Wear

One-sided wear can be described as fast shoulder wear on one shoulder and the fast wear continues along each rib in a decreasing manner as you go across the tread surface.



Fast  
Shoulder  
Wear

Fast shoulder wear is simply one shoulder (could be inside or outside) that has a rapid wear condition compared to the remaining tire ribs.

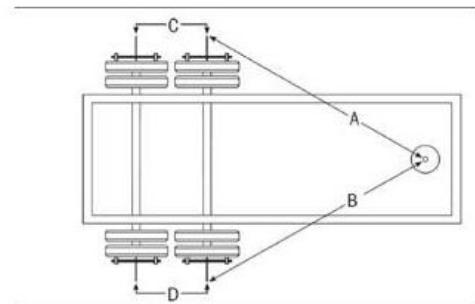
Underinflated trailer tires running on misaligned trailers is the worst scenario which leads to significant early tire removal miles due to irregular wear. Vehicle fuel economy can drop by as much as 3%.

An excellent source of additional information on tire wear conditions is published by TMC (Technology Maintenance Council) of the American Trucking Associations. This book is called the [Radial Tire Wear Conditions Analysis Guide](#)

If one-sided wear and/or fast shoulder wear is found on your trailer tires, a trailer alignment is in order.

In April 2012, TMC published an updated Recommended Practice on Trailer Alignment (RP 708B). This RP reviews the procedure required to perform a trailer alignment. It also talks about how to measure "Toe" which is the most important alignment setting when it comes to trailer tire irregular wear.

There is a very minimal investment required by fleets to perform a trailer alignment. You need a trammel bar, wheel-end extender, king-pin extender, a tape measure and a axon for marking the tires.



- Connect the wheel-end and king-pin extenders
- Measure the A B C and D distances
- A & B target measurements +/- 3/16" OR +/- 7/32"  
(depends on axle track & wheel-end extender lengths)
- C & D measurements <= 1/16"
- Measure "Toe" using the trammel bar

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