



As the Tire Deflates

Fleet Maintenance White Paper

This white-paper is the second (2) of eight (8) segments of the essential principles of the Preventative Maintenance Process enabling organizational success. The Preventative Maintenance Process is the most widely used fleet maintenance process in the transportation and service sectors.

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MCB Fleet Management

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As the Tire Deflates

Hey, LRO (Left Rear Outer) how's your pressure today, this guy is running pretty hard?" "I'm running about 132psi, how about you LRI? (Left Rear Inner)" "I'm at 70psi and I felt pretty good when we took off but now I'm running hot LRO." "You're hot LRI, I'm running hot cause you're flat and I'm carrying the entire load". Slacker!

No, tires really don't talk to each other, however, a problem with one (1) tire definitely causes a problem with the sister tire on the same axle. (Yes, in

today's technological age they can be monitored, more on that later.) In most cases tires are the number one (1) maintenance expense as well as breakdown cause, which in many cases can be prevented. Perfectly good tires lose

Perfectly good tires lose 2 to 4 psi per month predicated on usage.

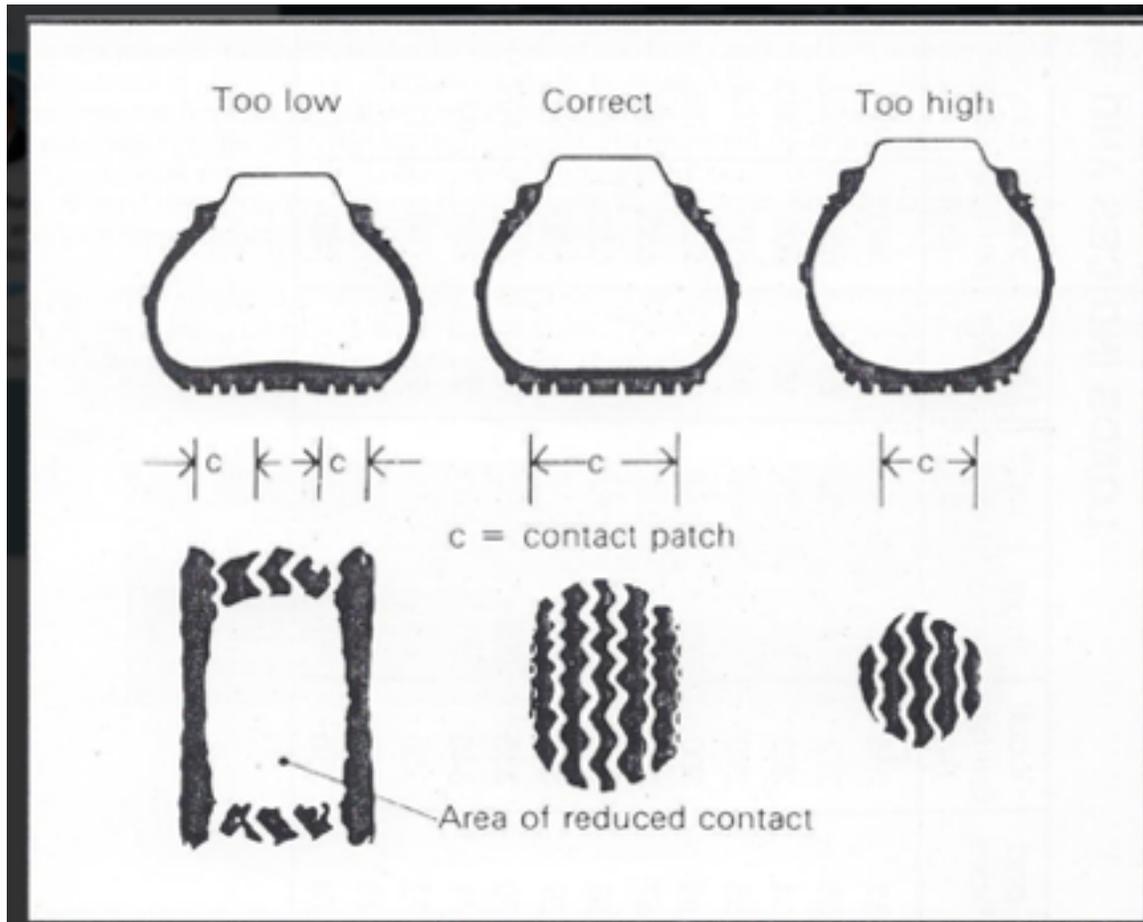
approximately two (2) to four (4) PSI per month predicated on usage. In case you're wondering, the air escapes through the pores of the rubber. In short, the more you use them (Get hot & cool off.) the more air they lose. Have you notice cars and trucks running around with low tires in recent years? This is due to the manufacturers extending oil change interval from 3000 to 7500 miles. Yes, you guessed it, if you see a car or truck with low tires it more than likely needs an oil change. However, there are cost-effective methods to mitigate these challenges, enabling you to reduce your number #1 expense category and improve your customer service index.

So what are the factors driving the bus?

Due to technological advances in managing the engine combustion process, as well as improved lubricants, fleets are now able to safely extend oil drain service intervals without negating warranties. However, tires still lose air and must be maintained. If tires didn't lose air you wouldn't want to ride on them and you surely wouldn't want to take a curve in the rain or snow. Necessity being the Mother of invention, the aforementioned advances in technology have perpetuated the development of a multitude of air inflation systems that come at a capital expense, however, as any maintenance system they must be maintained or

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they can become detrimental to the overall objectives of the organization. So what happens when tires are either under or over inflated? The short answer is in either instance, they run hot! They run hot because they either have too small or too large of a footprint as depicted in the diagram below.

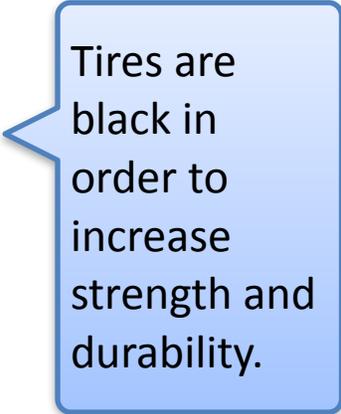


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Given the diagram above, it's easy to visualize a tire attempting to carry its share of the load and why it would run hot given the reduced contact with the road. Moreover, the more heat generated by the tires perpetuates more air to escape when they cool off, thus snowballing the predicament. So can you extend the PM service intervals? The answer is unequivocally yes, if you put some processes and procedures in place and stick to them with the same ferocity you secure your ATM password. Furthermore, in order for the tire process to

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perpetuate the desired success of the organization, the aforementioned information in regards to criticality of tire pressure must be widely known by all departments, not just maintenance. Everyone must be aware as the tires deflate profits, service, and morale also deflate. Spreading this knowledge will garner success across the organization as well as improving the cost and safety of the tires on their personal vehicles. My experience what most know in regards to tires is that they are round, hold air, and are black. While it is obvious why they are round, however, as previously mentioned they **do not** hold air permanently, and why are they black when rubber the natural color is that of a beige rubber band? Answer. Carbon is used to increase the strength and durability enabling them to survive the environmental and atmospheric conditions placed on them.



Tires are black in order to increase strength and durability.

Where to start?

Fortunately increasing accountability will decrease liability. The first step in holding everyone accountable to the tire process is a consistent message on the actual process, the ground rules, and expectations. Again, in order for this to have the desired impact the accountability must extend across the entire organization, not just the driver and maintenance. The consistent message is accomplished with a “**Tire Guide**” and a “**Tire Manual**.” These are two (2) separate documents each with a separate and distinct purpose. The “**Tire Guide**” is a two (2)-page user-guide concisely outlining the program for operations and technicians. This guide defines tires by brand, size, and alternatives by wheel position, pull-points, torque specs, as well as mounting specifications. This is a double-sided guide that in most cases is laminated in order to survive the technician environment.

The purpose of the “**Tire Manual**” is two-fold. First is to clearly define the process ensuring there are no gray areas in order to hold the vendor consistently accountable across the organization enabling sound tire selections that will increase the return on investment (ROI). Secondly, the “**Tire Manual**” is a reference guide should questions arise on the “**Tire**

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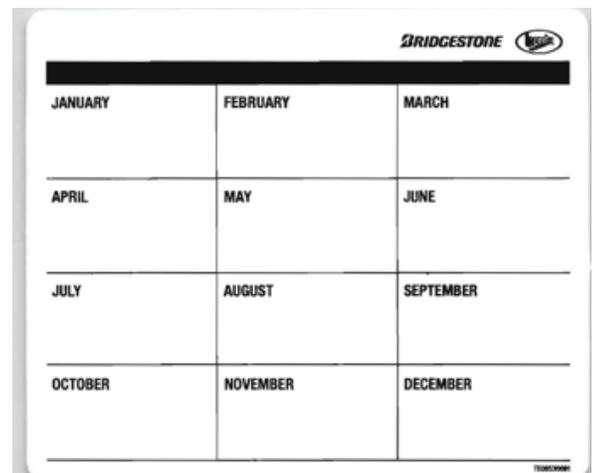
Guide” or any aspect of the tire process. Within the confines of this manual tire terminology will be explained and specifications will be spelled out in layman’s terms enabling all respective managers to ensure the processes are being followed by the vendor and hold them accountable to the recommended guidelines. Additionally, tire specifications, and retreading guidelines (If recapping) are also enclosed. The tire recapping process must be even more precise whereas not auditing it and holding the vendor accountable for one of your most costly expense items is putting the organization at undue risk. Furthermore, it must be noted that your local tire vendor’s profits are greater on recapped tires rather than on new tires thus perpetuating the need for strict local accountability. In order to accomplish this I recommend using the TMC (Technology Maintenance Council’s) “Recap Plant Audit” and complete the audit at least annually unannounced. I’d be remiss if I didn’t mention at this point that if you are outsourcing your tire process it must be strictly managed by an internal employee. As such, it must be a win-win for both the vendor and you the customer or it will lead to disastrous results.

So how can we effectively replace the air between PM cycles?

Tire Monitoring

One (1) highly effective approach is to strategically place a tire calendar on each unit. In most cases the calendar is placed in the glad-hand area (Tractor & Trailer) or where the driver will view it on a consistent basis in service applications. With a simple glance at the calendar the driver, maintenance, or management personnel will know the timeframe since the tires were last thoroughly inspected. This eliminates the need for a thorough yard-check inspection each day while simultaneously identifying where to place your resources for a maximum return. In most cases, (Not

encompassing road hazards) tires need to be properly inspected for all the critical factors every 90 days. This is a cost-effective alternative to air inflation systems. However, if you



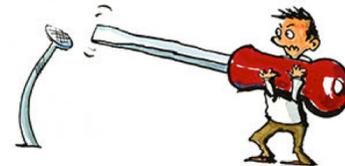
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have purchased one (1) of these systems it's imperative you add checking the system to your 90-day inspection and use the calendars to only further enhance the process. This process can be used further bolster the DOT and California BIT inspection processes. These calendars are available from all the major tire suppliers. This coupled with the drivers required inspections and your current PM process will drastically improve your tire process, reduced on-road failures, reduce cost, and improve customer service, and employee morale.

The callout on the previous page is a sample tire calendar from Bridgestone.

Elements of the Process

In order to increase asset utilization to satisfy shareholders and stakeholders, meet customer demands many organizations have increased their maintenance intervals. However, to do so it is imperative to have a rigorous tire process that identifies when tires need to be serviced between service intervals. If so, yes, you can extend your drain intervals and increase asset utilization but you need to implement the best method of monitoring and updating tire air pressures that most efficiently synchronizes with the operational demands of your organization or you will be increasing cost via tire failures. As previously mentioned, the lower or higher the air pressure is from the optimum PSI the more heat that will be generated causing the tire to lose more air as it cools down. (Catch-22) If you are **unable** to get an air replacement process between service intervals in place there is no need to purchase "Tier 1" tires, its just a waste of the maintenance budget. You might as well discard the recapping process as well and just by Chinese tires. **Conversely, the cost-effective methods to overcome these challenges/opportunities are as follows:**



- * Tires must be spec'd to meet the operational demands of the asset.
- * Driver Inspections - Tire knowledge is the only method to overcome this challenge.

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✳️ PM Inspection - Section of the PM inspection devoted to tires with rigorous guidelines coupled with mechanic knowledge.

✳️ Tire Calendars - Placed on all equipment enabling everyone a visual reminder of when the tires were last serviced properly. These can be used in place of air inflation systems, but they are a good idea even if you have invested the capital for the inflation system. Available free from manufacturers in most cases.

✳️ Use the FMCSA (Green Book) PSI correction factor when airing up warm tires. 15 psi on heavy duty tires and 5 PSI on light duty as a general rule of thumb.

✳️ Tire Guide - Double-sided one (1) page guide to ensure the tire specifications as well as suitable replacements are used by maintenance and operations succinctly outlining the process critical factors.

✳️ Tire Manual - Used to hold the tire vendors accountable to your process rather than what they deem acceptable or most profitable to them. This manual is imperative if you are recapping tires to capture the full life of the casings.

✳️ On dual applications when one (1) tire fails both tires need to be inspected in very short order or another failure is imminent due to it carrying a majority of the load for an unknown period of time.

✳️ Ensure tractor 5th. wheels are greased each time the tires are aired up. Dry 5th. wheels will perpetuate irregular tire wear in very short order and its like cancer, once it starts very difficult to counteract. Additionally, dry 5th. wheels will spawn a whole preponderance of other maintenance issues. It is also a very good indicator on the driver's knowledge and adherence to the pretrip & maintenance process.

✳️ Master Gauge - Used in all servicing locations to ensure the gauges used to check the tire pressures are accurate. If you don't have service locations you must ensure you vendor is using one and the gauges are checked for accuracy on a weekly basis, or anytime a gauge is inadvertently dropped. Master gauges must be calibrated quarterly.

Dry 5th. wheels will generate a preponderance of maintenance issues.

✳️Recap Program - Eighty percent (80%) of the cost of a tire is in the casing. If the size and nature of the fleet warrants and you have the qualified personnel to manage it, a recapping program coupled with a rigorous tire process can save the organization a great deal of expense by using the casing two (2) or three (3) times.

✳️Track Tires by Wheel Position - This mitigates fraud as well as assists in the analysis process.

✳️Mount Tires to the Cup Side of the Wheel - This is for dual wheel applications enabling the individual inspecting the tire to read the DOT & Recap Data.

✳️Mounted Wheel Program - If the size and nature of the fleet predicated it, yes, there will be a capital expense to have spare wheels in each location, however the ROI will come in very short order. **A few of the many advantages are as follows:**

- ✳️Matched tread-depth replacement tires capturing entire casing life.
- ✳️Decreased asset downtime and subsequent improved driver morale.
- ✳️Increased mechanic productivity & morale.
- ✳️Increased casing life due to fewer bead failures.
- ✳️Many more too numerous to mention.

✳️Tire Vendor Affiliation (Recommended Vendors) - This will afford you the opportunity of a yard checks and the associated scrap tire analysis which is additional step in protecting your assets and concentrating your efforts.

✳️Vendor Balanced Scorecard - Measuring you tire vendors performance on a quarterly basis.

✳️TMC Recap Plant audit. - Complete this at a minimum annually and request the results and action items from there most recent parent company audit to ensure deficiencies have been corrected.

Low Cost & High Quality Maintenance are Not Mutually Exclusive.

Here are just a few advantages of improved tire process:

- ✳ Increased asset utilization, driver productivity and morale, and organizational profitability.
- ✳ Improve customer service and service reliability.
- ✳ Reduce heat, which decreases wear on tires as well as brakes and wheel-end components.
- ✳ Reduced number of wheel-off incidents
- ✳ Longer asset lifecycle.
- ✳ Reduced hazardous wastes.
- ✳ Every dollar \$\$ saved goes straight to the profit line.
- ✳ Implementing a process of this nature with full organizational accountability

The Final Nail

The final factor and most important factor in the process is the driver. It has been proven the operator can have as much as 35% impact on fuel economy, consequently that same impact plays a factor in the combustion process as well as maintenance cost. To my knowledge, the percentage the driver pays in tire failures has not been calculated, however, I would be quite surprised if its not within the same ballpark. No matter what level individual you're hiring you should be hiring an individual with a teachable-spirit and this docility should extend to drivers as well. As previously mentioned, the only manner to overcome this significant challenge is with training. For example, extending the drain interval on an asset operated by a problematic operator who consistently demonstrates poor fuel economy on a properly operating unit, has a high-breakdown frequency, and is inept at performing an proper pretrip inspection is a prescription for disaster.

Recap

In conclusion, there are many elements to any rigorous tire process and these elements are predicated on the nature and operational demands of the organization. What I've provided you are a solid bases for any tire process. In short, its all about the process. All manufacturers make good products and all recapping processes are very effective at remanufacturing the tires. However, its all about who's maintaining the tires and who's hands in which the recapping process lies. With a rigorous tire process in place, it will decrease the number of times required to remove and replace the wheels which perpetuates metal fatigue on the wheel studs, causing them to inadvertently fail. In short, the key is communication and putting this on the forefront of everyone's priority list due to the cost, service, and company morale implications. Anytime a driver switches power units or trailers it is imperative they look at the tire calendar and inspect the tires prior to departure. Additionally, if the driver must pass through a security gate the guard should be required to inspect the calendar.

Inflating your tires on a regular basis you will be inflating your profits, customer service and safety indexes, company image, and employee morale.

The next section of the white paper will offer the key steps in building the backbone of your Preventative Maintenance process.

MCB Fleet Management Consulting

MCB Consulting was formed after a very successful career of twenty-five (25) years with UPS (United Parcel Service) which included the development and implementation of UPS Fleet Professional Service consulting subsidiary. Through the implementation of cost effective fleet asset and leadership processes, it is our goal to make the global marketplace a safer place to live and do business. We will accomplish this by lowering your operating cost, increasing efficiencies, improving fuel mileage, lowering vehicle emissions, and training your team to sustain these results in order to improve the environment in which we live.



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