

WHITE PAPER

Dynamic Tire Inflation Powers Fuel Tankers

Nothing can blow a hole in a fleet's maintenance budget, rack up downtime, and dent safety records like poorly maintained tires. On the other hand, properly maintained tires will lower cost of ownership while improving safety and downtime and maximizing payload. And there's game-changer technology rolling in now that will enable fleets to pay fuller attention to tire health and performance: Dynamic tire inflation.

Tire, one of the essential components of trailers, have long been a costly headache to manage. However, since the advent of tire pressure monitoring system (TPMS) sensors, which monitor tire pressure and temperature, fleets can receive real-time alerts when a pressure rise or drop occurs. An extension of this technology is automated tire inflation and deflation systems, which monitor individual tire PSI levels against the PSI setpoint designated by the fleet. The driver and fleet are notified when the PSI level differs from the setpoint while the system automatically adjusts the level up or down as required.

Now that fleets can add weight sensors, which read and provide the weight of the cargo load on the axles, the inflation/deflation system will automatically adjust pressure levels up or down depending on load weight. Deploying these enhanced, proactive maintenance practices and using real-time data will further extend tire life, increase load efficiency and capacity, reduce cost per mile, and reduce the potential for roadside failures.

Challenges

With costs rising and markets shrinking, fleets are looking to run more efficiently. One way to meet that challenge is to leverage "smart" telematic systems to boost efficiency. Yet the sheer volume of data these systems generate can overwhelm fleet managers, who then struggle with how to benefit from it. Most often, that data is being provided by multiple third-party vendors, all operating individually. Nonetheless, to gain value from such systems, it's critical that fleets learn to manage and use that firehose of data coming at them effectively.

The insights into tire health that smart systems provide are eye-opening for many for most fleets. Let's look at a recent example, the dynamic tire inflation system being used by Pilot/Flying J petroleum trailers.

According to Brent Hickman, the fleet's Senior Manager of Equipment Maintenance and Sales, it was essential to find a telematic platform that could link a multitude of sensors and deliver data through just one system.

The one-stop-shop Pilot chose was Dröv Technologies' AirBoxOne™, which connected tire monitoring, inflation/deflation, and weight sensors with Geofencing to automatically inflate and deflate tires on trailers, whether loaded or unloaded. Because Pilot is unique in that its trailers are loaded and unloaded often, it was important to be able to adjust inflation on the fly. The AirBoxOne™ system maintains proper pressure while the trailer is operating. That delivers more even tire wear as well as higher fuel efficiency.

The system's fuel and weight sensors operate in real-time on the hand-held dashboard that allows for maximum fuel loading. Pilot drivers have a dedicated mobile phone equipped with a mobile app to access the dashboard to manage the system. The driver as well as the fleet receives alerts and notifications through the device.

"Since the system allows us to adjust in real-time for maximum fuel loading, on our Oklahoma City trailer we have gained 2-1/2 more loads per shift. That's 25 more loads in our ten-shift work week," said Hickman.

With this comprehensive and open "smart trailer" solution, which connects a myriad of sensors, Pilot can integrate with third-party solutions but view and interface with just one dashboard. The integration also means Pilot has access to critical safety and maintenance features with key operational and safety information being relayed directly in real time.

Because of the success of the retrofitted trailers, Engineered Transportation International (EnTrans) is providing Pilot with new Heil petroleum trailers equipped with the Dröv AirBoxOne™ through their IntelliTANK. The first dozen tankers will be delivered in February, followed by another dozen in the first half of this year.

As it moves into the future with EnTrans equipped with IntelliTANK, powered by Dröv, Pilot can leverage the open smart trailer systems' data to not only increase operational efficiency and equipment utilization, but improve preventive maintenance, decrease maintenance costs, and enhance its safety record.

Pilot Statistical Results with Dynamic Tire Inflation

The Pilot/Flying J standard Heil petroleum tank trailers are built with Michelin X1-Multi Energy T, wide-based tires with new tire tread depth of 16/32 inches. Based on Pilot's maintenance software, TMT, the average life span for a Michelin X1 trailer tire is 208,500 miles.

Pilot replaces trailer tires at 14/32nd of total wear, so trailers get 14,893 miles per 32nd of wear.

Tank Trailer #1

Pilot retrofitted a 2022 Heil Phoenix, Arizona-based tank trailer with the Dröv AirBoxOne™ system. As of September 29, 2022, the trailer traveled 123,240 miles. Tread depths measurements below were measured using a traditional tread depth gauge:

- Front axle – 14/32
- Rear axle – 12/32

Using the depth of the rear axle: $123,240/4/32$ of wear = 30,810 miles per 32nd of wear, 431,340 miles per tire. Based on the data above, the Phoenix-based trailer is seeing a 51.7% increase in tire life using the dynamic tire system.

Tank Trailer #2

Pilot retrofitted a 2022 Heil Oklahoma City, Oklahoma-based trailer with the Dröv system. As of September 28, 2022, the trailer traveled 97,947 miles. Tread depths measurements below were measured using a traditional tread depth gauge:

- Front axle – 15/32
- Rear axle – 13/32

Using the depth of the rear axle: $97,947/3/32$ of wear = 32,649 miles per 32nd of wear. Based on the data above, the Oklahoma City-based trailer is getting a 54.4% increase in tire life using the dynamic tire system.

Expected financial impact using generic costs for the Phoenix-based trailer is expected to travel 2.5M miles over a 20-year life cycle.

1. Without the dynamic tire system –
 - $2.5M/208,502 = 12$ sets of tires in 20 years.
 - Using an estimated tire cost of \$850, 20-year tire cost = \$40,800, an average of \$2,040 per year.

2. With the dynamic tire system –

- $2.5M/431,340 = 6$ sets of tires in 20 years.
- Using an estimated tire cost of \$850, 20-year tire cost = \$20,400, an average of \$1,020 per year.

About Drōv Technologies

Drōv, a privately held company based in Oklahoma City, is the technology leader in the smart truck and trailer movement. Drōv strives to shape the market with a comprehensive solution for a fully enabled smart trailer, AirBoxOne™. Drōv will continue to be an engineering and technology pioneer in the autonomous transport vehicle market space. Drōv currently offers two systems through OEMs as well as to the aftermarket, including the Drōv SI Standard Inflation System and the Drōv AirBoxOne Smart Trailer System. For more information visit DrovTechnologies.com or call 844-375-DROV.