



ATMS - Adaptive Tire Management System

The new Trelleborg Adaptive Tire Management System (ATMS) is a Decision Support System (DSS) technology integrated into vehicle, designed to support the End User with single vehicle or fleet management operations.

The ATMS represents a breakthrough among the enabling technologies belonging to Agriculture 4.0, as it is capable of measuring the dynamic load of each single tire during operations. Through its sensors, mounted on a tire integrated support, the system detects the tire's working conditions in real time. This way the driver is advised on how to optimize tractor productivity and to reduce fuel consumption through:

- recommended inflation pressures
- correct tractor ballast and implement set up
- inputs for the tractor engine and transmission power management

BACKGROUND

Today, the state of the art is primarily focused on Tire Pressure Monitoring Systems (TPMS), which are designed to monitor tire pressure within pre-configured ranges to reduce tire damage and ensure driver safety.

TPMS were originally developed for passenger, commercial vehicles, trucks and bus applications to improve daily maintenance and to reduce downtime for tire substitution or reparation. However, these goals have been recognized as very limited and ineffective for highly specialized application segments like agriculture. Trelleborg Tires has engineered and developed a new value proposition, focusing entirely on individual agricultural applications, to provide concrete solutions to the market from both business and sustainability perspectives.

HOW IT WORKS

The ATMS combines the functionalities of a simple TPMS, which monitors tire pressure and temperature, with a real innovation: dynamic load. The data acquired by the tire sensors are

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processed by the gateway and sent through the tractor's CANbus, with the option to monitor data through the cabin video terminal.

A mobile application has been designed for direct sensor Bluetooth Low-Energy (BLE) transmission in place of the tractor video terminal. Additionally, a web platform integrated into the vehicle infrastructure allows for tractors or fleet data management through the cloud.

SOLUTION ADVANTAGES

The ATMS offers several advantages related to the direct support of end users (farmers and contractors) and Original Equipment Manufacturers, depending on the complexity level of vehicle implementation. This solution has been developed by Trelleborg Tires to be modular and to allow customizations based on specific market propositions.

When addressing End-User advantages, the solution is able to improve the vehicle productivity while reducing fuel consumptions, both for operations in the field and on the road.

These improvements are even transformed into operating costs (at the web platform level), in order to provide commercial estimates linked to session, period and yearly savings.

Furthermore, integration with the tire has been dramatically improved, by means of a sensor-ready tire equipped with the ATMS property design patch. The patch represents the sensor-tire interface; it is originally equipped on new tires during the curing operations and can also be adhered to existing tires.

FUTURE OUTLOOK

The ATMS will be proposed as Minimum Viable Product (MVP) solution as of June 2024 to allow Original Equipment Manufacturer (OEMs) to proceed with extended field validation. A second validation for aftermarket purposes will be carried out in parallel by Trelleborg Tires. Both validations aim at the technical and commercial validation and the customization of product infrastructure and functionalities, before starting the industrialization and certification phases.

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Trelleborg Tires is a leading global brand delivering advanced solutions for professionals in Agriculture, Material Handling and Construction. Trelleborg anticipates customer needs with a wide range of high-performing tires and complete wheels for off-highway vehicles, improving productivity, efficiency and environmental sustainability.

Press Contact:

Enrica Mussini
Global PR & Communications
Yokohama TWS
Email: enrica.mussini@yokohama-tws.com

www.trelleborg-tires.com

