

**Abstract of PhD dissertation entitled**  
***“Innovative remote monitoring system as a tool for tire pressure determination and its impact on selected exploiting parameters of the truck fleet”***

Maintaining adequate a tire pressure, recommended by the manufacturer, it affects the longer safe operation of the tire, the amount of fuel consumed as well as passive safety of vehicles. On the other hand, incorrect tire pressure can cause a loss of vehicle stability, a blowout of the tire and can indirectly lead to a collision or road accident. There are many tire pressure monitoring systems on the market but they have many imperfections. These imperfections include, e.g.: the inability to perform measurements of additional exploiting parameters (such as temperature or tread height), the lack of a double control system - alarming both the driver and the dispatcher about changes in tire pressure and the lack of data transfer from the system to the spreadsheet at any time. Therefore, it was important to develop a tire pressure and temperature monitoring system with the option of transferring data to spreadsheet files at any time. The system is also characterized by double control - alerting the driver and the dispatcher about changes in tire pressure and temperature, which will ensure proper reaction to changing parameters and making decisions regarding the exploiting process.

The aim of the work was to design, validate and verify and then implement an innovative remote tire pressure monitoring system for a fleet of vehicles in oversize transport.

The work performed, including fundamental research:

- ✓ remote measurements of tire temperature and pressure in all monitored vehicles,
- ✓ stationary measurements of tire pressure in vehicles without a system,
- ✓ stationary measurements of tread height in tires of all vehicles.

Moreover, the impact of tire pressure and selected exploiting parameters on fuel consumption in vehicles with a monitoring system was determined, and tests of the

significance of tread height differences in vehicle tires with the system installed and vehicles without a monitoring system were performed.

Based on the presented results of the tire pressure measurements it was clearly stated that measurements performed only during the comeback of the vehicle from the route to the base are insufficient. In vehicles without monitoring system, tire pressure was recorded at a lower level than the manufacturer recommended. On vehicles with a installed tire pressure monitoring system, the pressure was maintaining on balanced level.

Designed and implemented tire pressure remote monitoring system for the fleet of oversize vehicles, it prospect to making the right decision which concern the correction of the measured parameters in the direct mode after receiving a signal about the need for their correction by the driver.

Making decisions based on the obtained measurement results from the monitoring system allows reducing the company costs with the exploitation of tires. Tire pressure monitoring tailored to the driving process helps to improve the efficiency of the vehicle fleet.

The obtained results allowed to achieve the aim of this dissertation and confirm the validity of the adopted thesis.