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## **DEVELOPMENT AND VALIDATION OF MOBILE TIRE FITTING COMPLEX PARAMETERS FOR REPAIRING AND MAINTENANCE SERVICE**

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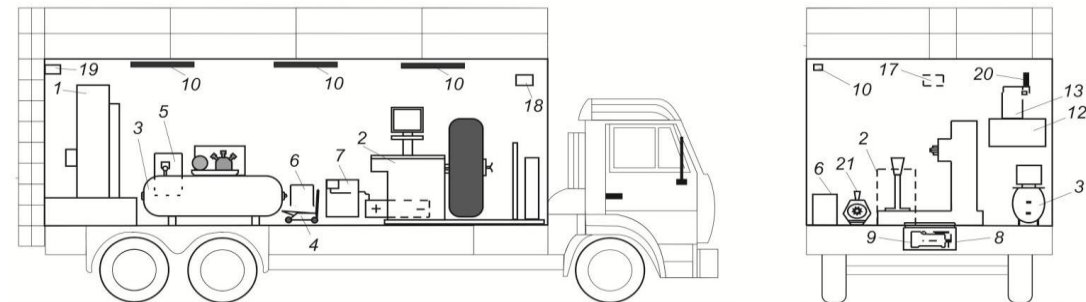
Nowadays it can be noticed not only the development and improvement of cars, trucks and agricultural machinery, but also the development of repair and diagnostic equipment from experience with tire mounting and balancing equipment for auto service. The vehicles and tractors which enter farming industry are operated mainly on dirt roads that have many potholes and irregularities, that significantly affects their drag out and dynamic index, reliability and lifetime of the transmission mechanisms, the safety of the cargo, the fatigue of the driver and passengers, sustainability and safety, as well as tire wear. In this regard, a constant search of theoretical and experimental research in the field of repair improvement and maintenance are required as well as methods of diagnosing trucks and transport equipment.

The analysis of the existing works [1-3] shows that, despite a certain progress and achievements in advancement of repair and diagnosing of agricultural machinery it is rational to consider questions on creation of mobile tire complexes for repair and servicing of vehicles. Today, of the known designs of mobile tire complexes leads to decrease in efficiency of tire works. For example, the mobile tire complex for repair and servicing of trucking facilities containing tire and balancing stands [2] is known. A lack of such design is insufficiently wide range of the provided services.

The mobile tire complex for repair and service of vehicles which contains tire and balancing benches, the equipment for pump of buses, system of power supply, the additional equipment is best suited to the proposed technical solution according to the solvable task and the achieved technical result [3]. A lack of such construction is that the complex operates tire works for vehicles with the maximum radius of wheels up to 24 inches and weighing up to 60 kg.

Thus, the specified imperfection of the known designs results in decreasing of tire works. In 2016 within an initiative theme, the design of a mobile tire complex was developed for repair and service of vehicles (drawing) which contains the following equipment: the automated tire stand, the balancing stand, the compressor, a hydraulic tire jack, a set of the equipment for replacement brake and lubricant cooling fluids, the charging pull unit for accumulator charging and a starting engine operation of cars, the accumulator of battery type, the inverter, the

electro petrol generator, sources of a working light, a reducer for untwisting of difficult removable nuts, a box for tools, a vulcanizer, wheels control on leak proofness, the electrical system of giving and discharge of water, the electro welding inverter equipment, a searchlight, system of video surveillance, socket connections 220V, the switch, the heat gun, a luggage compartment, a metal ladder.



Drawing figure – The developed mobile tire complex for repair and service of vehicles

The work of the developed mobile tire complex for repair and service of vehicles is carried out under following: the emergency complex comes out to the location of the vehicle which needs tires changing ; before carrying out tire operations the system of power supply of a complex with switching on of the electro petrol generator is launched, it should be grounded beforehand, or the accumulator with the inverter is connected; then the automated tire bench which is advanced by a working part for open back doors of the van is brought to working state; the wheel removed by means of a jack or portable support of the most cargo vehicles which is fixed on the automated tire bench then tire changing is done ; the vulcanizer allows to perform the repair of damages of vehicle tires by the method of heat curing with the subsequent installation of plasters by cold method, and also repair of cameras; ;or the compressor with the pneumotool is used for pumping, which is located in a box for tools; spare tires and wheels are taken from the luggage carrier fixed on a van roof; there is a metal ladder on a back door of the van for convenience removal of spare tires and wheels, ; after tire changing , the wheel for balancing is set on the balancing bench; the balancing bench works with the maximum blade circle diameter of 30 inches and with a maximum weight of wheels up to 150 kg; after execution of tire operations, in case of desire it is possible to carry out with the help an equipment set – changeover of lubricant or cooling liquid of the engine and to use a set of the additional equipment (from a box for tools – devices for check of spark plugs and wash of fuel systems, etc.) for carrying out repair of separate nodes of the vehicle, and also operations on maintenance of its general working capacity; for example, by means of system to realize check of wheels on tightness, check of spark plugs or wash of fuel system;

the system of video surveillance allows to exercise the general control of quality of the performed works.

As a result of advancement of a mobile tire complex for repair and servicing of vehicles, the patent application of the Republic of Kazakhstan has been applied [4]. It is necessary to research the development of the digital model in the program environment of the Solid Works or ANSYS application programs for higher accuracy of determination of rational design data.

Thus, the developed mobile tire complex for repair and servicing of vehicles increases efficiency of tire works.

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