

FUNCTIONALITY TEST OF ELECTRIC TRACTOR CONTROL CONVERSION SYSTEM

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ABSTRACT

This research aims to test the functionality of a control conversion system on an electric tractor to support the implementation of more efficient and environmentally friendly agricultural technologies. The developed control system is designed to regulate the movement of the electric tractor by controlling speed, transmission, and direction of travel using key components such as a BLDC motor, controller, throttle sensor, and tractor chassis. The research method involved designing and directly testing the converted control system. Functional testing was then conducted to determine the performance of each component and the system's response to operating commands. Testing included speed control via the throttle sensor, transmission operation, and the reverse system to ensure all functions were operating as designed. Test results showed that the electric tractor control conversion system functioned well according to its design objectives. The throttle sensor was able to regulate speed responsively, the transmission system operated stably, and the reverse mechanism was able to change direction effectively. Overall, the developed control system was deemed feasible and has the potential to support the development of electric tractor technology in the modern agricultural sector.

Keywords: *agricultural mechanization, control systems, conversion, electric tractors, functionality testing.*