

Abstract for NFPA's 2007 Educator/Industry Summit

Purdue University
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Self Propelled Water Hydraulic Vehicle

ABSTRACT

García, José Manuel. M.S.E., Purdue University, December 2006. Self propelled water hydraulic vehicle. Major Professor: Gary W. Krutz.

This project determined the amount of energy saved after the conversion of the first all water hydraulics vehicle. A Jacobsen Greens king VI lawn mower was converted from oil to water hydraulics and the hydraulic circuit was divided into two systems, one controlling the propulsion and the steering of the vehicle, the second circuit to handle the motion of the grass cutters. The experimental results gathered from the prototype were input data for a simulated system using MSC EASY5. The simulation system was run using water and hydraulic oil. The simulated pressure drops for both fluids were compared to estimate the power and fuel savings resulting from the vehicle's conversion to water hydraulics. The calculated power saved for the hydrostatic drive system was 0.27 HP. 1.07 HP was calculated to be saved for the reel drive system savings. The total calculated system savings were 1.35 HP out of the required 11.4 HP needed to run all functions in the system. Approximately 12% savings in power consumption.

Keywords: Water hydraulics, water powered vehicle, EASY5 hydraulic simulation, water hydraulic components.