



University of Banja Luka
Faculty of Mechanical Engineering
26th - 28th May 2011

DEMI 2011

*10th Anniversary International conference
on accomplishments in
Electrical and Mechanical Engineering and
Information Technology*

PROCEEDINGS

ZBORNİK RADOVA

BANJA LUKA, May 2011.



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**PROCEEDINGS OF THE 10th ANNIVERSARY INTERNATIONAL CONFERENCE ON
ACCOMPLISHMENTS IN ELECTRICAL AND MECHANICAL ENGINEERING AND
INFORMATION TECHNOLOGY**

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IMPROVEMENTS OF GROUND VEHICLES FUEL ECONOMY USING REGENERATIVE BRAKING

Jasna Glišović¹, Jovanka Lukić², Danijela Miloradović³

Summary: The electrification of conventional vehicles, ranging from passenger vehicles and trucks to ground vehicles such as agricultural tractors, construction equipment and military vehicles, can potentially offer improvements in fuel economy and emissions. Nearly all conventional vehicles are powered by a gasoline or diesel fueled internal combustion engine that converts the energy stored in the fuel to rotating power out of the engine. Internal combustion engines are relatively inefficient, typically converting only 25 to 35 percent of the input energy in the fuel to the output shaft to do useful work. With heavily fluctuating fuel prices, the total cost of ownership of loaders, excavators, and other classes of ground vehicles is nowadays strongly influenced by the fuel costs. Moreover, there is growing concern about CO₂- emissions caused by the burning of fossil fuels as well as about the long-term availability of these fuels. The military is particularly interested in the electrification of vehicles because the attributes that these vehicles possess offer exceptional potential for the military to achieve its long-term objectives of developing a highly mobile, lethal fighting force.

Key words: ground vehicles, regenerative braking, fuel economy

1. INTRODUCTION

The increasing demand for oil is a global issue, and solutions to this problem are driven by the sudden increase in demand from developing industrial nations, such as China, sustained demand from developed nations, such as the USA, and the knowledge that soon the demand for oil will exceed the production capability (Fig. 1). Hybrid vehicles are just one of a number of solutions suggested by the transport industry to reduce dependency on oil and harmful GHG emissions. "Hybrid" has its origin in the Greek language and means: "Mixture or combination of two things." Hybrid vehicles use two types of energy to attain optimum propulsion. Combustion engine demand is reduced by hybrid technology, giving the user two big advantages: lower fuel consumption and a significant reduction in emissions. The most common hybrid technologies are electric and hydraulic hybrids [1].

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