

**THE INFLUENCE OF GEAR RATIO ON THE EXHAUST
EMISSION AND FUEL CONSUMPTION OF A PARALLEL
HYBRID VEHICLE POWERTRAIN**

M.tech Dissertation

by

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ABSTRACT

Hybrid electric vehicles are becoming the major alternative for internal combustion engine vehicles because hybrid electric vehicles are noteworthy in terms of efficiency, durability and acceleration capability. Hybrid vehicles offer improved fuel economy and greenhouse gas reduction compared to vehicles with internal combustion engines only. The purpose of this study is to investigate the influence of gear ratio of gearbox unit, differential, and torque coupling unit in fuel consumption and exhaust emission of parallel hybrid powertrain. Study was carried out in MATLAB/SIMULINK environment. Five gear ratio combinations are simulated which includes gearbox unit, differential and torque coupling unit. From the simulation it noted that It is noted that 10% fuel economy improved and 8% of CO₂, 11% of CO, 2% of HC, and 4% of NO_x reduction achieved by using proper gear ratio in powertrain components.