**Case Study on Continuously Variable Transmission Engine**

Abstract:

The efforts to further reduce fuel consumption of vehicles equipped with a push belt type Continuously Variable Transmission (CVT) focus on different sources of loss. In this paper the magnitude of these losses and their potential for reduction is described. Inside the CVT, the variator, its control strategy and the hydraulic actuation circuit can be distinguished as the main potentials. A major opportunity is offered by a new control strategy that takes the actual slip between belt and pulley as the control parameter. The resulting decrease of clamping forces on the push belt leads to a reduction of variator and actuation losses. Further potential is found in the hydraulic actuation circuit by an improved tuning of the power supply to the actual power requirement. Outside the CVT additional potential is found in start-stop functionality as supported by measures inside the transmission. The paper describes the theoretical background as well as practical fuel savings of up to 5.5% that were obtained in tests on vehicle level. Slip control adds an inherent robustness to the operation of the push belt and opens up the fuel saving potential of the CVT giving great potential to further improve its position as a state of the art automatic transmission technology.