ELECTRICALLY ASSISTED TURBOCHARGING FOR LIGHT-TRUCK DIESEL ENGINE APPLICATIONS

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Advances in turbocharging technology from free floating to wastegate to variable nozzle turbine (VNT) turbochargers are described. VNT turbochargers have helped diesel engines make tremendous progress in increased power density, reduced emissions, improved fuel economy, and driveability. Electrically assisted turbocharging enables further progress in all areas and allows precise control of the air-fuel ratio throughout the speed-load range of diesel engines.

The paper describes the design and status of development of an electrically assisted turbocharger suitable for application to small and medium diesel engines. Preliminary results on engine performance with and without electrically assisted turbocharging are presented. It is shown that the development of a low-cost power electronic control system is a major challenge.