

Automotive turbocharging

Abstract

The future trends of automotive engine are universally toward down-sizing, higher power density and above all lower carbon emissions. Among many technologies revolutionizing automotive development, turbocharging is considered as a significant enabler to meet the ever increasing future demands. Uchida (2006) provided a good discussion on the future trends for the automotive industry and the inherent role of turbocharging, with focus on the Toyota research developments. Figure 1.1 shows the demand for specific power to increase to 70 kW/l and CO₂ emission to reduce to 115 kg/km by the year 2010. Achieving the goal, according to Uchida (2006), will need technological steps forward with turbocharging enhancement as the main player. These views are also shared by Shahed (2005) in his article discussing the general demand and importance of turbocharging for the current and future automotive power train. Down-sizing and emission reduction were the main driving force behind the significant development of turbo diesels in Europe and similar development are predicted for the United States automotive industry.