

2007-01-1558

## Development of a Fully Variable Compressor Map Enhancer for Automotive Application

Neil Fraser, Tristan Fleischer, John Thornton  
MAHLE Powertrain Ltd.

Joerg Rueckauf  
MAHLE International GmbH

### ABSTRACT

Since the agreement to reduce average new car CO<sub>2</sub> emissions to 140g/km by 2008, fuel consumption improvement has been one of the main drivers for engine development within the automotive industry. Numerous technologies to reduce vehicle fuel consumption have been investigated, with gasoline engine downsizing being shown as one of the most promising technologies for immediate implementation. In order to achieve further fuel economy gains more aggressive levels of downsizing are being pursued, increasing the requirements for broader and higher pressure ratio compressor maps.

The currently reported work shows the development of a fully variable compressor map enhancer, which has the ability to provide both positive and negative pre-whirl. The effect of the map enhancer is shown on both the surge and choke margin of the compressor map when tested on a turbocharged gasoline engine.