

HERCULES Task 3.2, Intelligent Turbocharger: Final Results, November 2007



Partners:

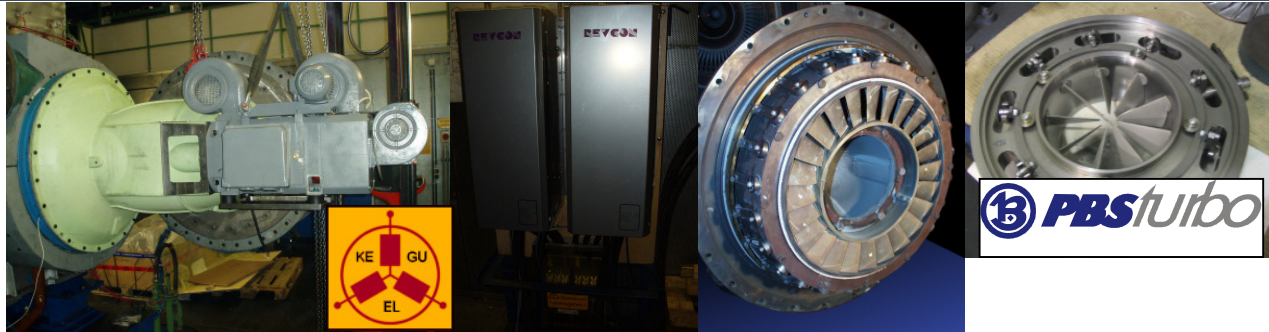
- Kemmerich Elektromotoren GmbH & Co. KG
- PBS Turbo s.r.o.
- MAN Diesel A/S & MAN Diesel SE

Prototypes:

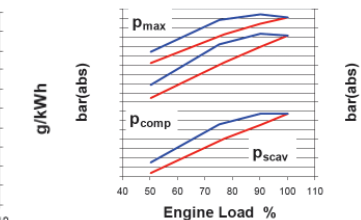
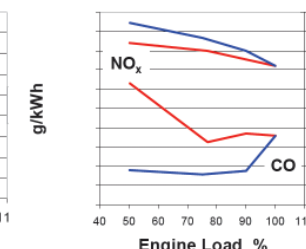
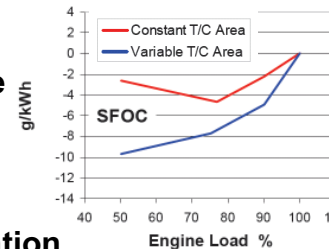
- Asynchronous electric PTI/PTO machine controlled by power electronics
- Variable turbine apparatus, VTA, for turbochargers with radial-inflow or axial-flow turbines
- Variable compressor apparatus, VCA
- Two-stage turbocharging system
- Assemblies for 2-stroke and 4-stroke engine applications, e.g. variable valve train, VVT

Experimental results:

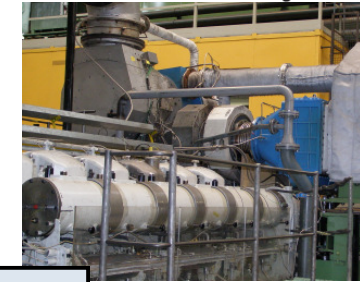
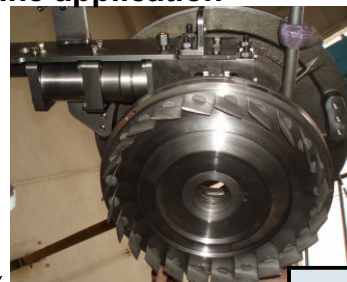
- Improvements in the SFOC-NO_x trade-off (2-stroke and 4-stroke engines)
- Up to 35% savings in NO_x, max. of 8% reduction in SFOC (4-stroke engine), 7% savings in SFOC at part load for the 2-stroke engine
- Smokeless 4-stroke engine by VVT & VTA
- Improved dynamic load response by 2-stage turbocharging with VVT & VTA



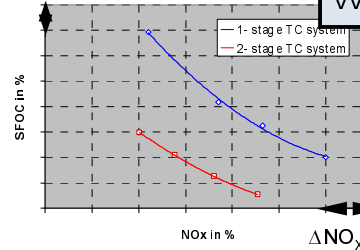
2-stroke engine application



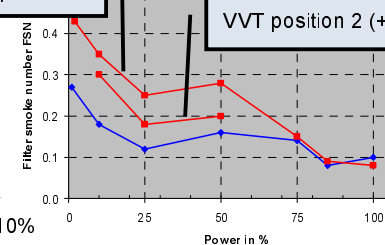
4-stroke engine application



ΔSFOC=2%



VVT position 1



VVT position 2 (+20° CA)

