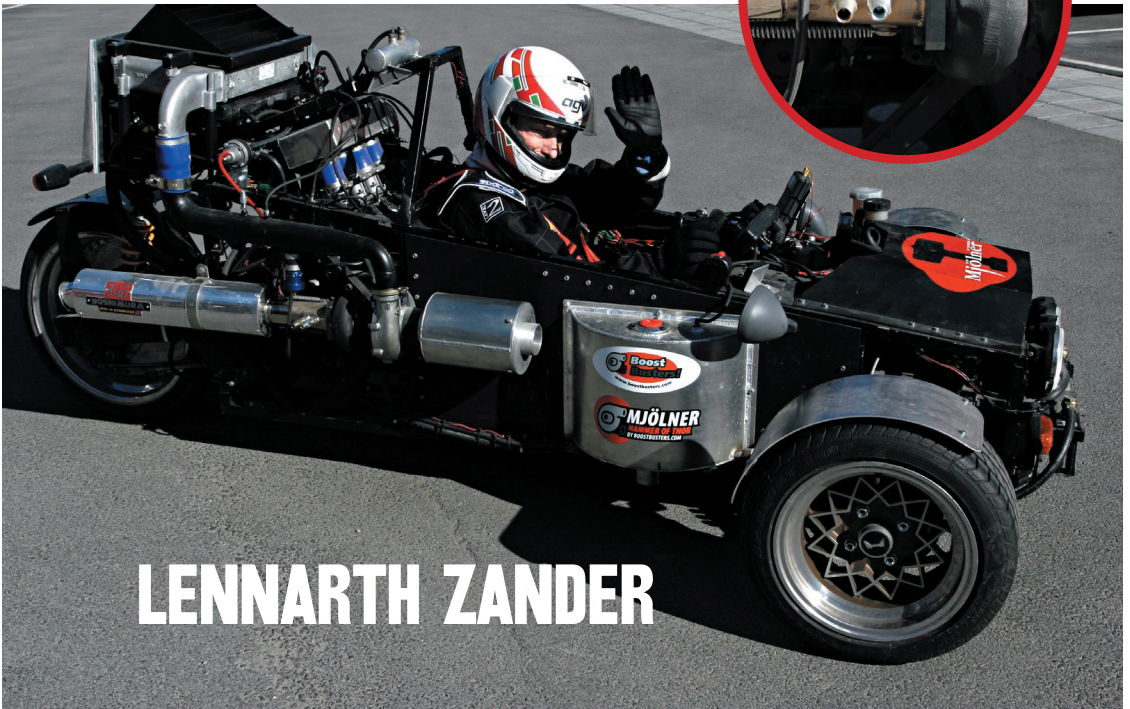


# INTERNAL COMBUSTION ENGINES GASEXCHANGE & BOOSTING



**LENNARTH ZANDER**

# New Reference Book on Engines!

## Internal Combustion Engines – Gasexchange & Boosting

by Lennarth Zander

The new book: "Internal Combustion Engines – Gasexchange & Boosting" is based upon the former series of "compendiums":

- Compendium 1: Single cylinder 4-stroke SI Engines
- Compendium 2: Multi cylinder 4-stroke SI Engines
- Compendium 3: Boosted 4-stroke SI Engines
- Compendium 4: Boosted 2-stroke SI Engines
- Compendium 5: Advanced Boosted 4-stroke Engines

However the text is completely rewritten and a lot of material is brand new. The content is updated and developed to become a more comprehensive package. Graphics is in colours to make it easier to spot different combinations in multi layer plots.

The book contains both theory and a lot of examples on running engines. The textbook is written for anyone who is really interested in Internal Combustion Engines and the numbers of equations have therefore been kept to a minimum.

The textbook is ideal for educational purposes and can be used by the readers on their own or in combination with lectures. A complete package of lectures is 32 hours which can be ordered by BoostBusters separately.

The author Lennarth Zander works as group manager (EGM) at General Motors Powertrain in Södertälje, Sweden. Lennarth holds a Master of Sciences in Mechanical Engineering and also participated in education for PhD in Mechanical Engineering at Chalmers University. Lennarth spent 12 years in the Volvo Group at different positions as Gasmanagement and Charging specialist for both gasoline and diesel engines. During his spare time, Lennarth have engineered and tested several turbocharging concepts for both motorcycles and cars.

# From the Contents:

## Combustion Engines in General Motors

- Engines and humans are related!

- Combustion engines subsystems

## Gasexchange

- Calculation and testing together!

- Internal and external gasexchange

## Gasexchange – Single Cylinder 4-stroke

- Simulation code GT-Power

- Presentation of simulation objects

- Simulation of different geometries

## Gasexchange – Multi Cylinder 4-stroke

- When multi cylinder effects must be present

- Pros and cons multi cylinder effects

- Simulations of several interesting multi cylinder engines with different firing orders

  - 2 cyl. uneven firing order, 3 cyl. 120 deg., 4 cyl. engines

  - 5 cyl. engines, 6 cyl. engines, 8 cyl. V-engines

## Boosted 4-stroke Engines

- Aspects on cylinder number while boosting

- Design aspects different chargers

- Design aspects Turbo

- Speed vectors compressors & turbines and Eulers equation

- Turbine efficiencies versus U/Cs

- Corrected mass rates

- Nomenclature different turbo suppliers and corrected units

- Library different compressors and turbines from different suppliers

- Inertia & response

- Impulse- vs. constant pressure boosting

- Design aspects mechanical driven compressors

- Multiple turbo charging

- Parallell turbo charging

- Serial turbo charging

- Limit for single stage turbocharging

- Cluster Turbocharging

- Charge air cooling with turbo machinery

## Gasexchange – Single Cylinder 2-stroke Engine

“Neither self aspirating nor self exhausting”

Limitations regarding feeding, scavenging and exhausting

DR, TE, CE and SE comparison to 4-strokers

Boosted 2-stroke engine

Turbocharged 2-stroke engine with virtual turbo

Turbocharged 2-stroke engine with “real” turbo

Power level at the same level as Formula 1!

Compressor maps with lug lines and pressure traces in exhaust port

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## Order form

I hereby order: \_\_\_\_\_ copies of **Zander, Internal Combustion Engines – Gasexchange & Boosting**. Price: € 79.00

I hereby order: \_\_\_\_\_ copies of **Zander, Förbränningsmotorns gasväxling och uppladdning** (swedish text). Price: € 59.00

Postage will be added to the prices.

I wish to be contacted for more information when the books are published.

The books are approximately 650 pages each and preliminary publishing date is February 2006. Orders can be made by email: **order@jure.se**

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