

# Contributions to the Development of Heavy-Duty Engines



Source: MTU

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# Heavy-Duty Engine Test Benches



# Heavy-Duty Engine Test Benches

- Test bench dimensions: 7,5 x 14.4 x 5 m
- Power per test bench: 4000 kW
- Power transient: 800 kW
- Tandem setup possible
- conditioned inlet air temperature  
(adjustment of humidity and temperature possible)
- Cooling water systems suitable for pressure-free sea water engine operation
- Supply of all liquid fuels
- Natural gas supply  
(starting at a system pressure of 50 hPa)



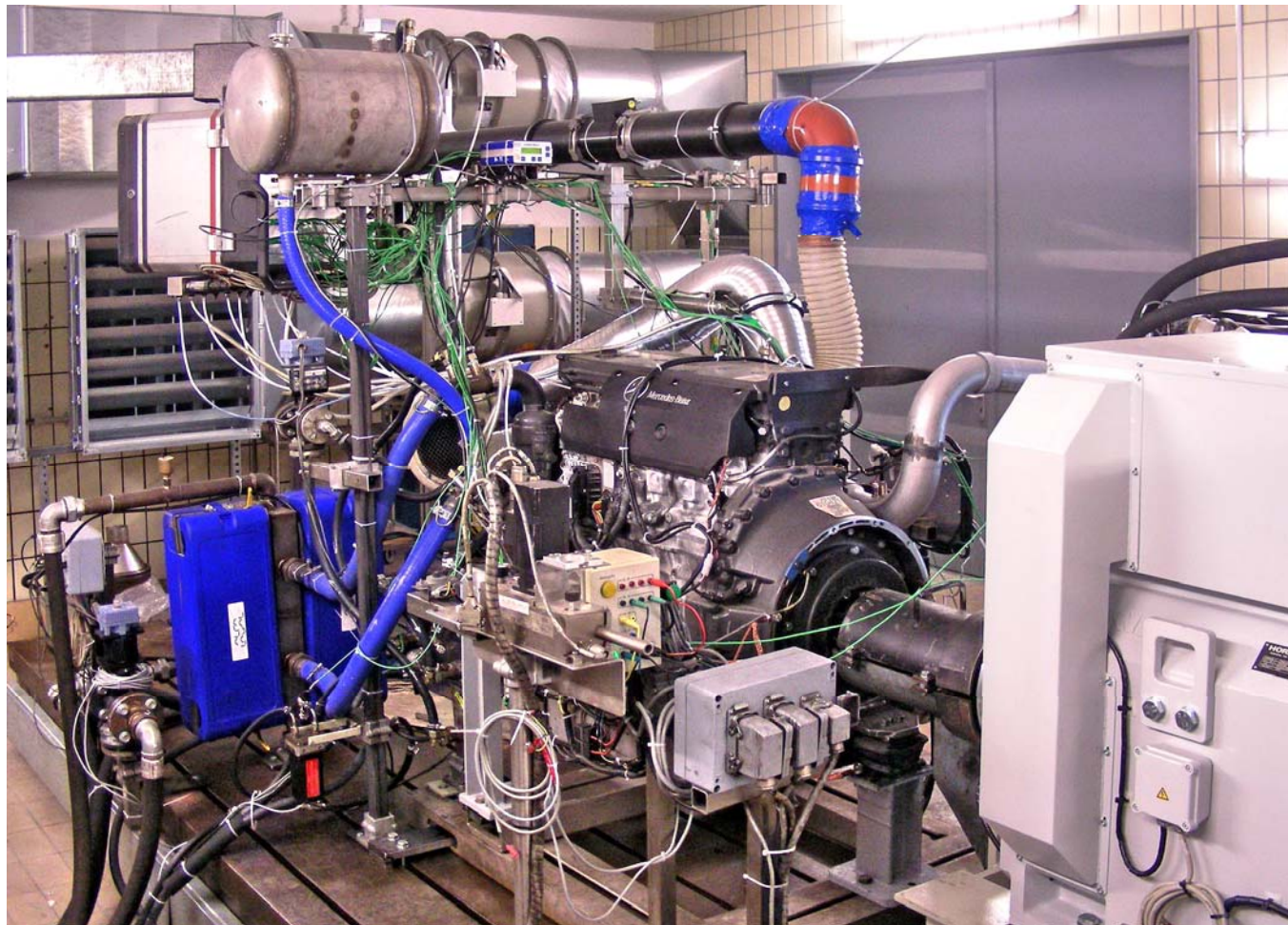
# Heavy-Duty Engine Test Benches



- Pressure-free supply of a sea water cooling system for sea water operation
- Lower temperature limit of circulation water
- Upper temperature limit of circulation water
- Admissible temperature deviation from the setpoint value
- Heat flow transfer
- Admissible engine peak intake pressure
- Circulating water flow
- Admissible peak circulating water flow



# Development of Heavy-Duty Engines



## Dynamic Test Bench


- Conditioned inlet air temp. : 6500 m<sup>3</sup>/h
- Relative humidity : 50 %
- Supply and exit air : 50000 m<sup>3</sup>/h
- Temperature, conditioned : 25 °C
- Max. power output : 800 kW
- Max. speed : 3500 rpm
- Max. torque : 5000 Nm
- Load unit : AC-machine  
HD800 for  
transient tests



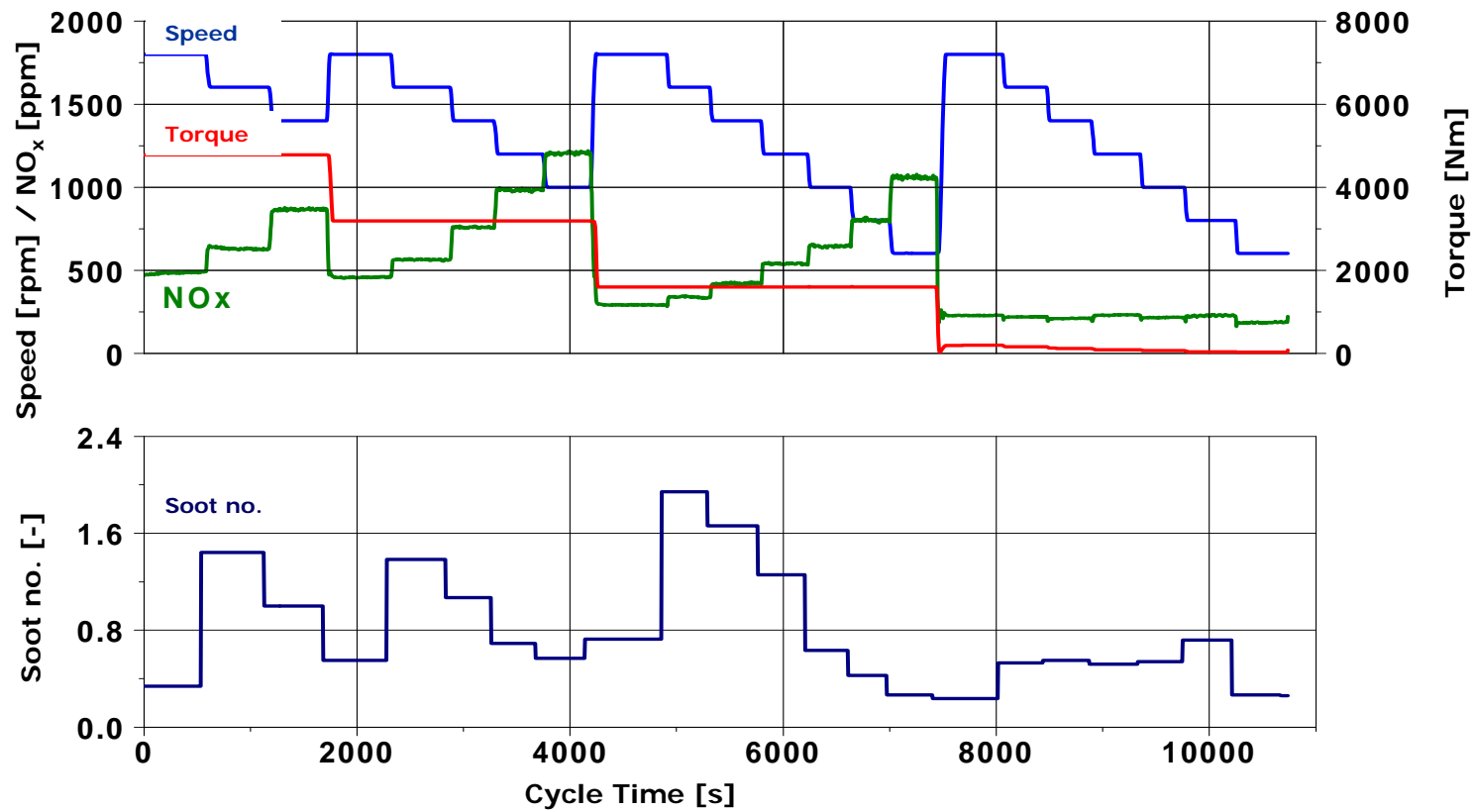
## Emissions Development Area

- Diesel Particulate Filter (DPF) for low-emission diesel engines (e.g. for river boat applications)
- Exhaust after-treatment systems such as SCR

## Certifications

- Certification according to UIC 1 and 2 (UIC-Union Internationale des Chemins de fer) 
- Certification according to the Lake Konstanz-Shipping Regulation
- DPF-Certification according to 9768 EG (DPF Aftermarket System for Off-Road Vehicles)
- Certification according to EURO 1, 2, 3 and 4 (NRTC/NRSC)

## Emission Calculation for UIC Certification



- Engine application  
(computer-based optimization, Cameo, application tool, Inca, ATI)
- Analysis of exhaust gas after-treatment systems (DPF regeneration strategies, SCR systems, catalysts)
- Emission measurements according to current and future emission standards (Europe, USA)
- Temperature and pressure measurements  
(up to 200 channels)
- Installation of indication measuring system
- Modal and swing analyses (mobile system also available)
- Strain measurements (application of strain gauges via KST employees)

- Storage of 20 different fuels
- Storage equipment for supply of bio fuels
- LPG 8 bar / 20 bar
- CNG 70 bar / 200 bar



# Locations



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