Heavy-Duty Engines

Source: MTU
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Heavy-Duty Engine Test Benches

Power Output per Test Bench : 4000 kW
Power Output, Transient : 800 kW
Surface Area of Test Bench : 7,5 x 14,4 m
(Inlet Air Temperature, Conditioned)
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 25°C
- Upper temperature limit of circulation water 32°C
- Admissible temperature deviation from the setpoint value ± 2°C
- Heat flow transfer > 1700 kW
- 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. : 12000 m³/h
- Relative humidity : 50 %
- Supply and exit air : 50000 m³/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

Emissions Development Area

- Diesel Particulate Filter (DPF) for low-emission diesel engines
- Exhaust after-treatment systems such as SCR

Certifications

- Certification according to UIC 1 and 2 (UIC-Union Internationale des Chemins de fer)
- DPF-Certification according to 9768 EG (DPF Aftermarket System for Off-Road Vehicles)
- Certification according to EU III A and III B and EPA Tier 3 and 4 in accordance with the latest emission laws and regulations (off-road engines)
- Upgrading of exhaust gas after-treatment systems for commercial vehicles (according to Anlage27)
- All certifications are carried out in close cooperation with technical inspection agencies, such as TÜV, Germanischer Lloyd, etc.
Emissions

Emission Calculation for UIC Certification

- Speed [rpm] / NOx [ppm]
- Torque [Nm]
- Soot no. [-]

Graph showing the relationship between speed, torque, NOx, and soot number over time.
Functional Testing

- 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)
Supply of Standard / Alternative Fuels

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