Engine Testing
Lubes and Fuels
Company

- Service provider for engine-testing of lubes and fuels
- Endurance testing of engines and powertrain
- Engine research
- 40 years of competence
History

1967  Foundation
      Engine Testing of lubes and fuels

- 2000  Durability testing of engines/components, R&D-Services
        in thermodynamics, emissions, on-road testing

- 2005  Upgrading of the test benches with dynamic load units
        for passenger cars and commercial vehicles

- 2009  Heavy duty engine testing
        Powertrain testing
        Expansion of the company's premises
Engine Testing Lubricants

OM501LA
OM646DELA
VW 1.9 TDI
VW T4

Rig-Test: VW-Cam and Tappet

Wolf-Test-Strip device
Contents (Fuels)

- Engine Testing Fuels
  - PSA DW10
  - M102E
  - PSA XUD9
  - M111E – in preparation
Contents (Special Services)

- Online Oil Consumption Measurement
- Online Oil Dilution Measurement
- Storage Capacity / LPG, CNG supply
- Certifications
Engine-Testing of Lubricants and Fuels (Survey)

- **Lubricants**
  - OM501LA CEC L-101-07 (Bore Polishing, Piston Cleanliness and Turbocharger Deposits Test)
  - OM501LA CEC L-101-07 (Low Viscosity 5W-30 Test)
  - OM646LA CEC TDG L-099 (Cam Wear and Engine Cleanliness Test)
  - VW 1.9 TDI CEC L-78-T-99 / VW PV1452 (Ring Sticking and Piston Cleanliness Test), official release for both test procedures
  - VW T4 VW PV1449 (Change of Oil Viscosity and TBN)
  - VW Cam & Tappet VW PV5106 (VW Valve Train and Wear Test; Rig Test)
Fuels

PSA DW10  CEC F-98-08  (Injector Fouling Test)
M102E  CEC F-05-93  (Inlet Valve Deposits Test)
PSA XUD9  CEC F-23-01  (Injector Nozzle Coking Test) in preparation 2009
Engine Testing Lubricants: OM501LA


The test procedure for this engine was developed to supersede the OM441LA (widely used in specifications of ACEA, Daimler, Detroit Diesel, MAN and MTU for defining piston cleanliness and wear protection)
CEC TDG L-099: OM646 DELA – 2L Daimler engine

The test was designed to simulate nowadays service challenges of such engines that include particulate traps and alternative fuel components.

The test is superseding the OM602A and OM611LA test procedures of CEC and DC.
Engine Testing Lubricants: VW 1.9 TDI

CEC L-078-99: VW 1.9L TDI

Due to severe turbo-charging and high piston temperature (oil sump kept at 145°C!), this test discriminates Diesel engine oils in terms of piston cleanliness.
Engine Testing Lubricants: VW T4

VW PV 1449: Volkswagen T4 engine (2L - 62kW)

This 248 h lasting engine test leads to a severe degradation of base oil and additive components (see graphic) by putting thermal and oxidative stress on all engine parts, including the lubricant.
Rig-Test Lubricants: VW Cam and Tappet

**VW PV 5106: VW Cam and Tappet**

A fast way to check valve train wear protection selectively is the VW Cam and Tappet Rig Test.
KST has developed and is producing that screening device for testing the detergent-dispersant and anti-oxidant behaviour.
CEC F-98-08: PSA DW10 / 2L DI Diesel Engine

The test has been introduced in order to reduce the injector fouling tendency.

Rated parts and results:
- Power loss
- Fuel analysis

1. Deposits in the injector nozzle hole
2. Deposits at the injector nozzle tip
3. Deposits around and on top of the injector nozzle cone
Engine-Testing Fuels: M102E

CEC F-05-93: M102E / 2.3L Daimler Gasoline Engine

The aim of this test is the evaluation of gasoline or gasoline additive formulations in order to prevent deposits from inlet valve in PFI engines.

This test visualises the beneficial effects of additives.
CEC F-23-01: PSA XUD9A / 1.9L Diesel Engine

This test is designed in order to evaluate the injector nozzle coking tendency of diesel fuels.

The 4-cylinder indirect injection diesel engine is operated at low-load. The tendency of the fuel to produce deposit formation is determined by injector nozzle flow measurement.
Special Services: Online Oil Consumption Measurement

- Online data acquisition
- Tracer medium complies with the molecular oil structure (the engine can be reused directly again)
- Selective testing of components (e.g. TC, cylinder head)
- Determination of oil consumption starting from 0.1 g/h
Special Services:
Online Oil Consumption Measurement

LOC Turbocharger Map of 1.9 TDI Diesel Engine with normal engine condition and plugged air filter simulation

Oil consumption Diesel Turbocharger
Special Services: 
Online Oil Dilution Measurement

- Investigation of regeneration or cold start strategies for diesel and gasoline engines
- Wear measurement with means of different grades of oil dilution
- Investigation of worn injection systems

**Functional Depiction**

**sampling parameters:**
flow ~ 1 l/min  
chamber volume ~ 0.3 l  
p = 3 - 5 bar
Storage Capacity

- Storage capacity for 20 different fuels (Bio-Fuel tolerant)
- LPG 8 bar / 20 bar
- CNG 2 bar / 70 bar / 200 bar
Certifications

Accreditation (DAR) acc. to DIN 17025 for lubricants and fuels
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