

# Engine Testing Lubes and Fuels



# Company

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

- 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

# Contents (Lubes)

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- Engine Testing Lubricants
  - OM501LA
  - OM646DELA
  - VW 1.9 TDI
  - VW T4
- Rig-Test: VW-Cam and Tappet
- Wolf-Test-Strip device

# Contents (Fuels)

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- Engine Testing Fuels
  - PSA DW10
  - M102E
  - PSA XUD9
  - M111E – in preparation

# Contents (Special Services)

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- 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)

# Engine-Testing of Lubricants and Fuels (Survey)



- 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



## CEC L-101-07: OM501LA Euro V – 12L Daimler engine

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)



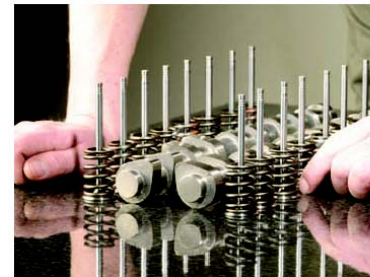
# Engine Testing Lubricants: OM646 DELA



## 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



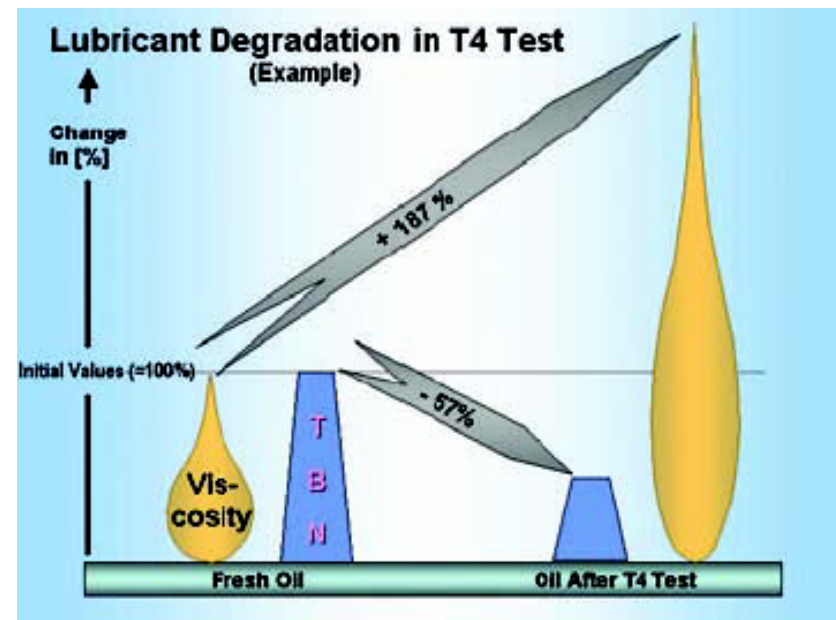
## CEC L-078-99: VW 1.9L TDI

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.



## 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.



# Wolf-Test Strip Device / Lubricants



KST has developed and is producing that screening device for testing the detergent-dispersant and anti-oxidant behaviour.



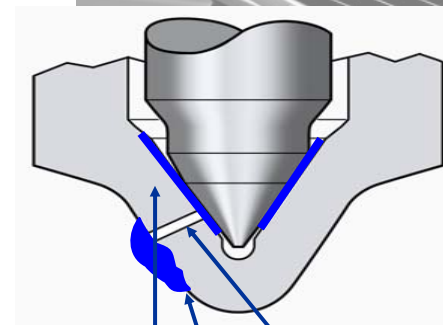
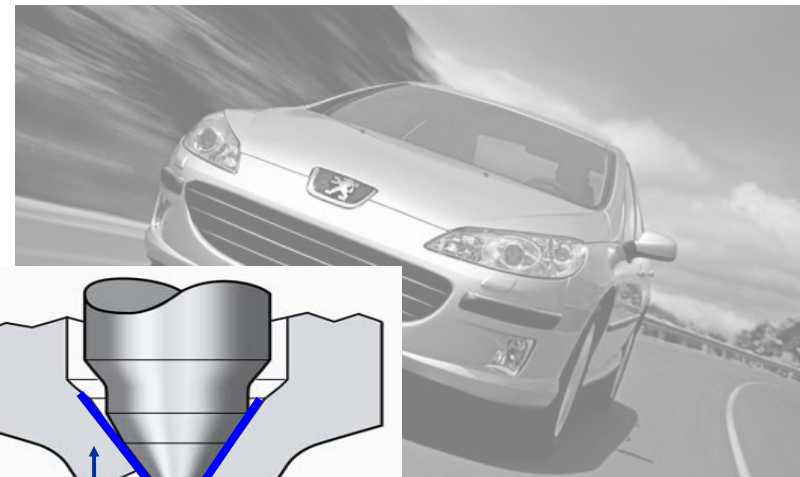
**Wolf-Test Strip Device**

## 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

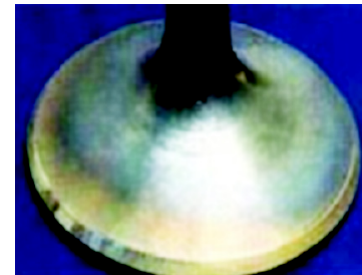


- 1 Deposits in the injector nozzle hole
- 2 Deposits at the injector nozzle tip
- 3 Deposits around and on top of the injector nozzle cone

## 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.



# Engine Testing Fuels: PSA XUD9 – in preparation



## **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.

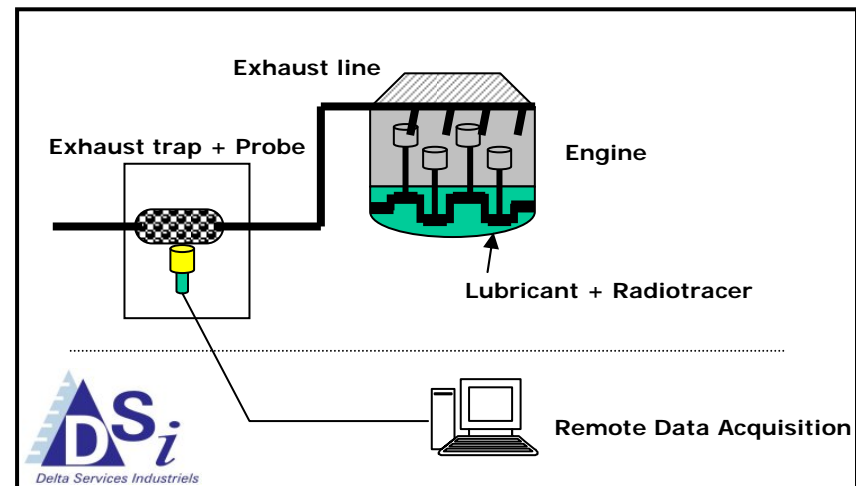
The 4-cylinder indirect injection diesel engine is operated at low-load.

The tendency of the fuel to produce deposit formation is determined by injector nozzle flow measurement.

# Special Services: Online Oil Consumption Measurement

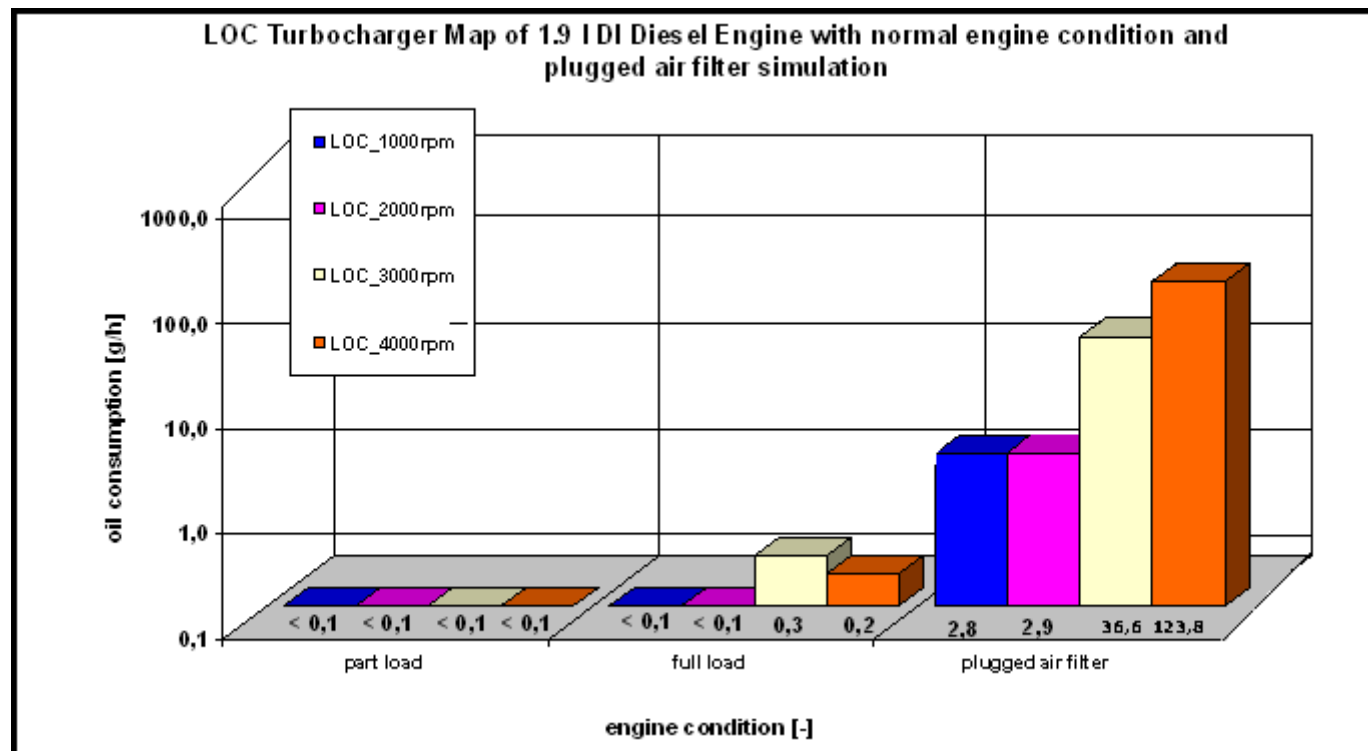


- Online data acquisition
- Tracer medium complies with the molecular oil structure (the engine can be reused directly again)
- Selective testing of components (e.g. TC, cylinder head)
- Determination of oil consumption starting from 0,1 g/h



Functional Depiction

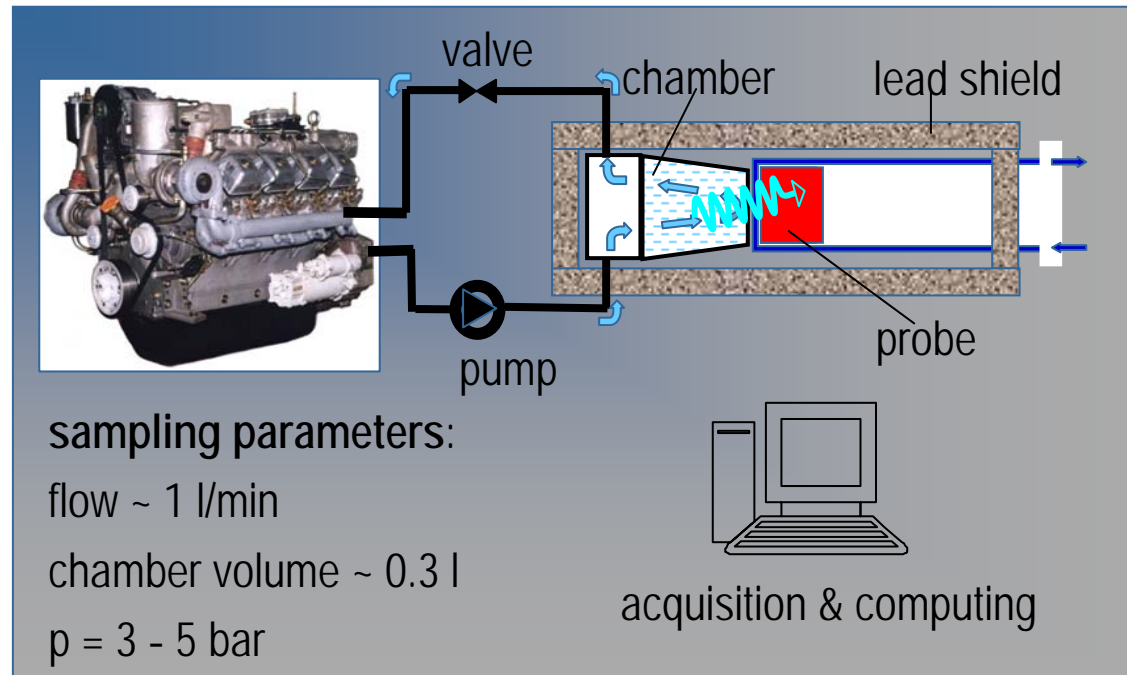
# Special Services: Online Oil Consumption Measurement



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

# 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



# Locations



**KST Motorenversuch GmbH & Co. KG**  
Bruchstraße 24 - 32  
67098 Bad Dürkheim  
Germany  
Phone : +49 6322 - 799 0  
Fax : +49 6322 - 799 353  
E-Mail : [info@kst-motorenversuch.de](mailto:info@kst-motorenversuch.de)  
Internet: <http://www.kst-motorenversuch.de>



**GEVA Gesellschaft für Entwicklung  
und Versuch Adlershof mbH**  
Willy Wolf-Bau  
Friedrich-Wöhler-Straße 1  
12489 Berlin  
Germany  
Phone : +49 30 63 92 - 74 10  
Fax : +49 30 63 92 - 74 70  
E-mail: [service@geva-adlershof.de](mailto:service@geva-adlershof.de)  
Internet: <http://www.geva-adlershof.de>