

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

- 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
 - 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

Contents (Special Services)



- Online Oil Consumption Measurement
- Online Oil Dilution Measurement
- RNT Wear Measurement
- Alternative fuel investigation
- Storage Capacity / LPG, CNG supply
- Certifications

Engine-Testing of Lubricants and Fuels (Survey)



- Lubricants

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

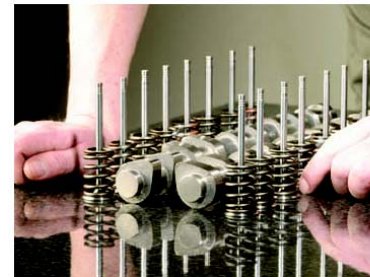
CEC F-23-01

(Injector Nozzle Coking Test)

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



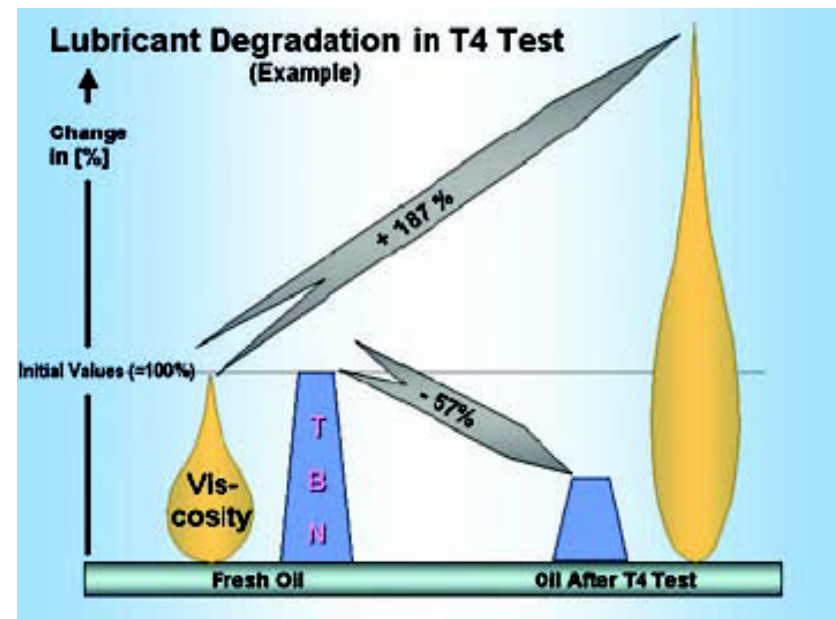
CEC L-078-99: VW 1.9L TDI / PV 1452

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 cleanlines.



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.

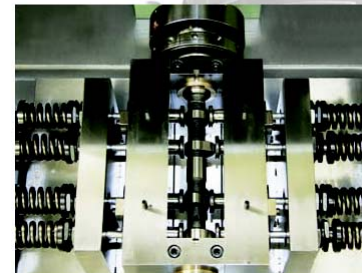


Rig-Test Lubricants: VW Cam and Tappet



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.



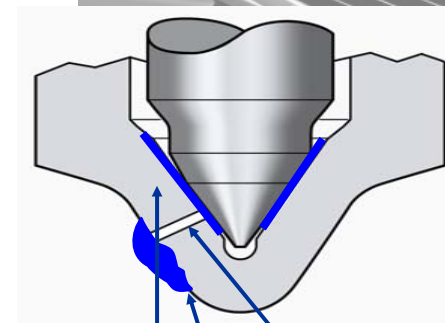
Wolf-Test Strip Device

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

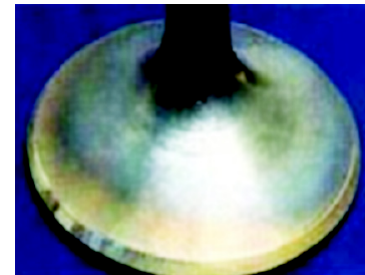


- 1 Deposits in the injector nozzle hole
- 2 Deposits at the injector nozzle tip
- 3 Deposits around and on top of the injector nozzle cone

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.

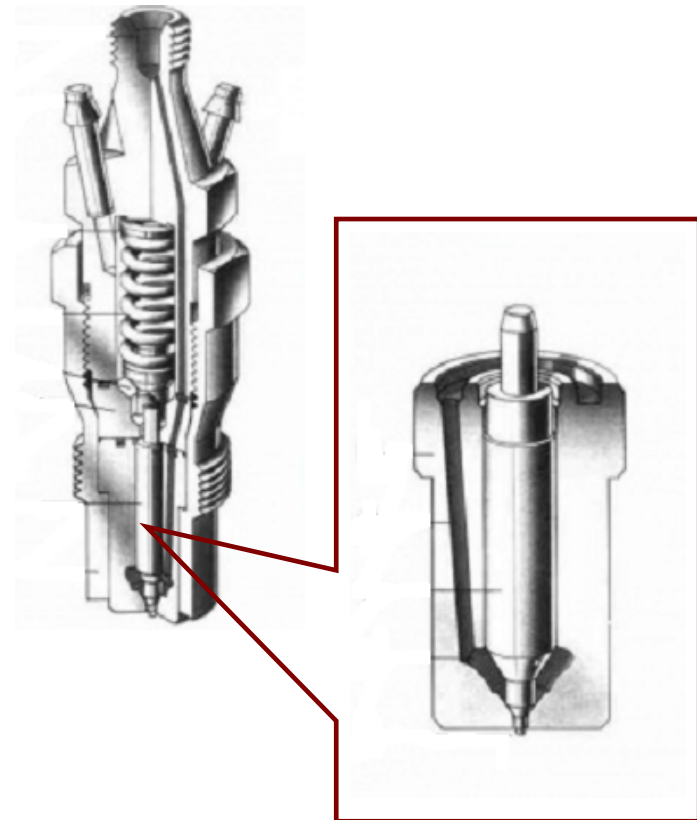


CEC F-23-01: PSA XUD9A / 1.9L Diesel Engine

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

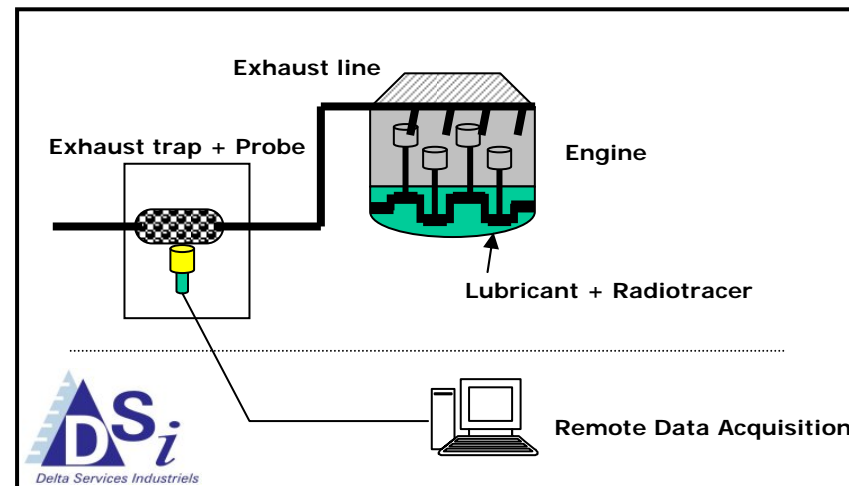
The 4-cylinder indirect injection diesel engine is operated at low-load.

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



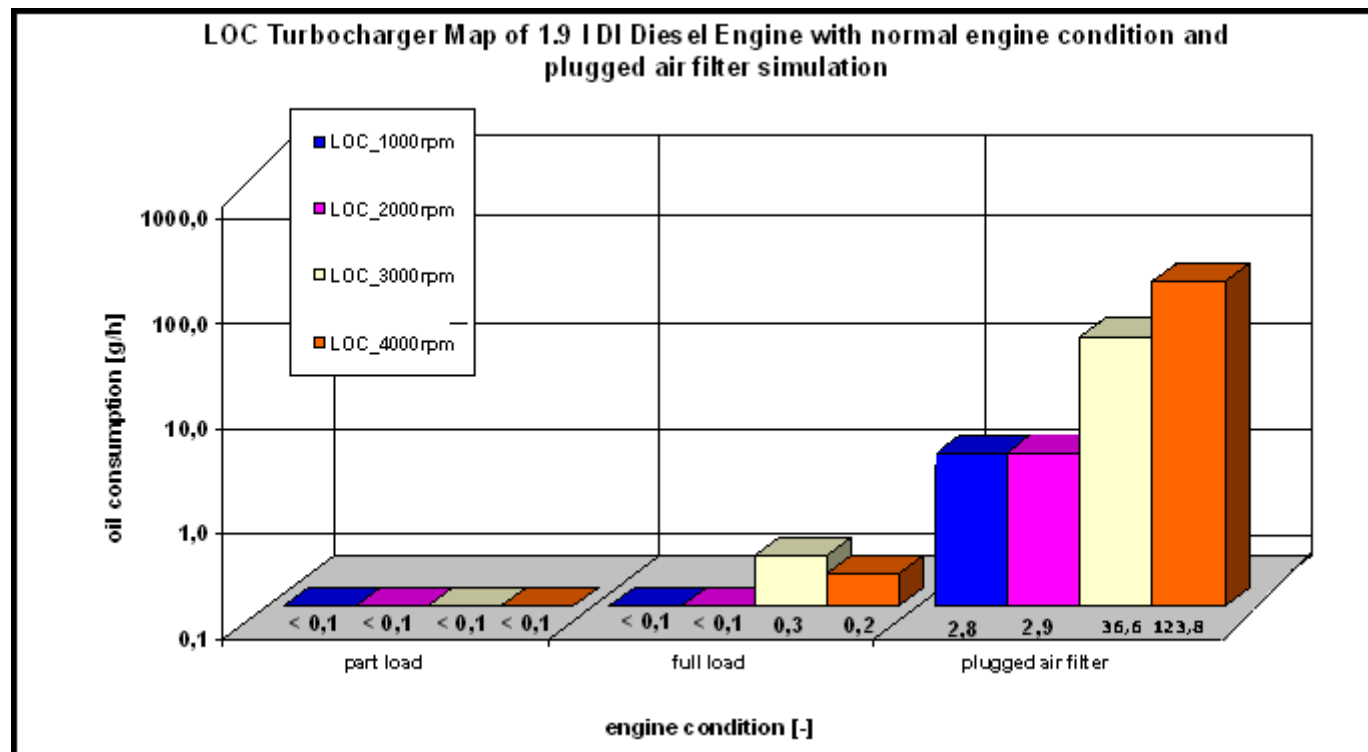
Special Services: Online Oil Consumption Measurement

- 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

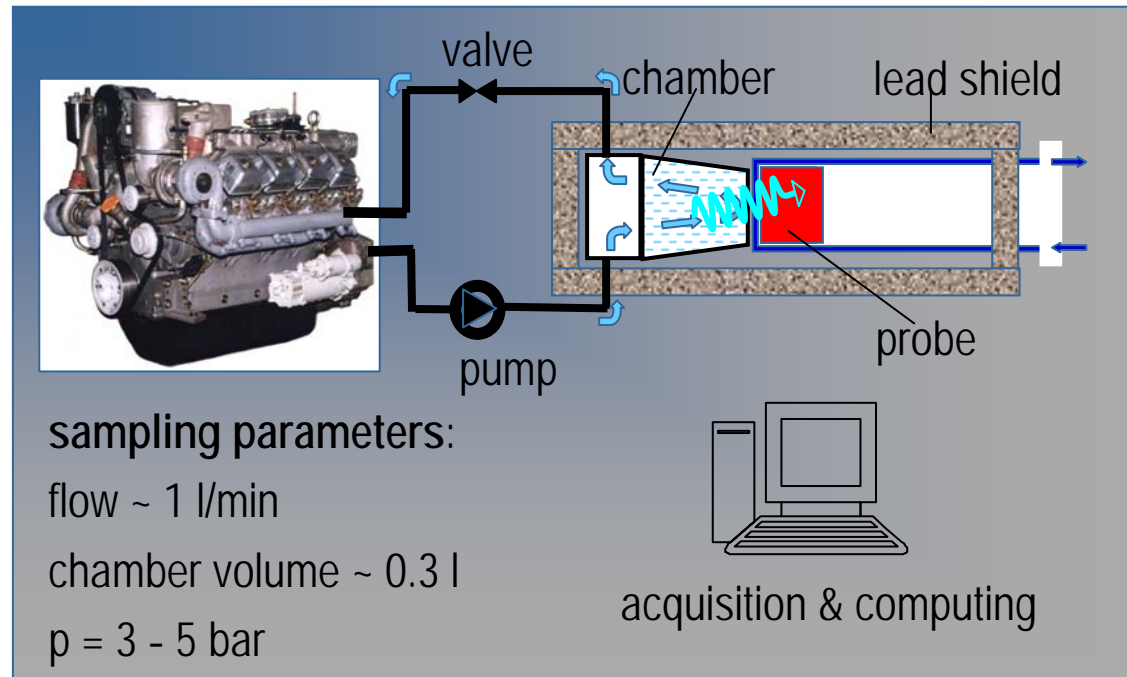
Special Services: Online Oil Consumption Measurement



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



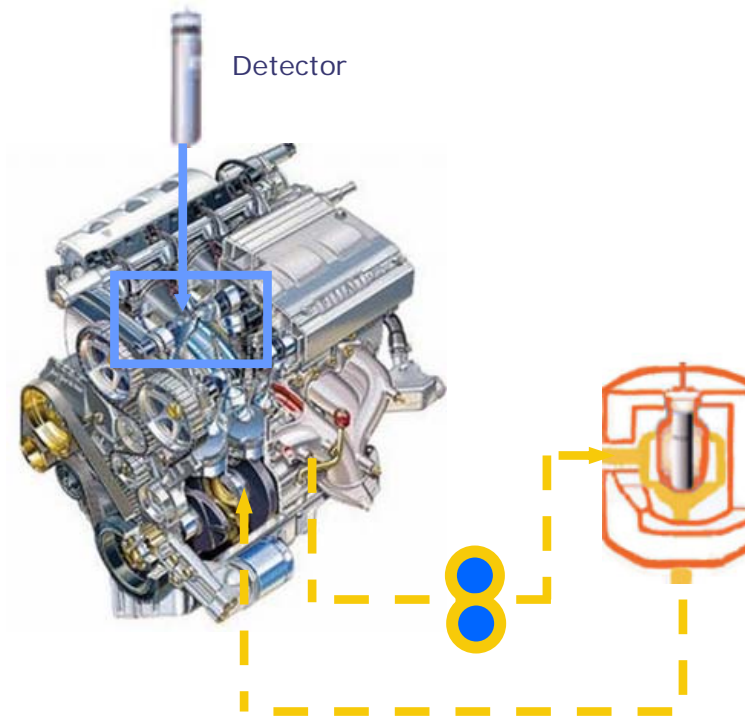
Functional Depiction

Range of applications

- Cylinder : liner wear at TDC
- Piston : piston ring
ring groove
- Bearing : connecting rod
crankshaft
camshaft
- Valve : seat, stem, guide
- Cam lobe, bucket tappets

Combination of Blowby Measurement,
external oil pressure control

Thin Layer Differential Metrology
measurement directly on component, e.g. valve

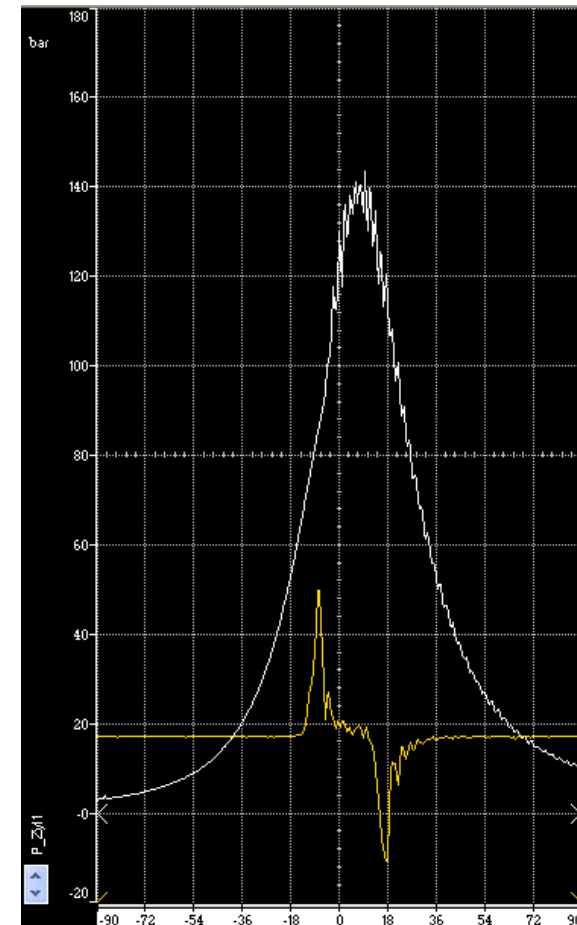


Concentration Metrology
measurement within oil circuit, e.g. crankshaft

Range of investigations:

- Power
- Fuel consumption
- Combustion
- Emissions
- Wear
- Lubricant impact

Including experience with special fuels
(f. e. fuel / DME)



Combustion signal of F34 jet fuel

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



Engine Testing Lubricants: VW 1.9 TDI



Accreditation TL 521 95 PV 1452

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2. Oktober 2009 Datum
3 Seitenanzahl

Kontrollprüflauf TL 521 95 / PV 1452

Sehr geehrter Herr Wolf,
gemäß unserem Anerkennungsverfahren stellen Sie uns einen Kolbensatz aus dem

Kontrollprüflauf:	1004921
Referenzöl:	RL 206/5
Referenzkraftstoff:	CEC-RF-90-A-92/14
Testdatum:	18.08.09
Prüfstand:	KST 20

für eine Nachbewertung zur Verfügung.

Wir können Ihnen heute mitteilen, dass die Anforderungen der TL 521 95 Abschnitt 6.6.4 erfüllt werden.

Das Bewertungsergebnis und den für eine Ölfreigabe erforderlichen Grenzwert entnehmen Sie bitte den Anlagen.

Sollte zwischenzeitlich kein Wechsel des Kraftstoffbatches stattfinden, so endet der Anerkennungszeitraum am 19.12.2009.

Mit freundlichen Grüßen

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Accreditation TL 521 95 (VW 50 200)/PV 1449

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30. Apr. 2009 Datum
3 Seitenanzahl

Kontrollprüflauf TL 521 95 (VW 50200) / PV 1449

Sehr geehrter Herr Wolf,
gemäß unserem Anerkennungsverfahren stellen Sie uns eine Gebrauchtlölprobe und einen Kolbensatz aus dem

Kontrollprüflauf:	1004955
Referenzöl:	ESSO EGL 76409/4
Referenzkraftstoff:	VW T4 Test Fuel (CEC RF-83-A-91) Batch 15
Testdatum:	27.02.09
Prüfstand:	28

für eine Nachbewertung zur Verfügung.

Wir können Ihnen heute mitteilen, dass die Anforderungen unserer TL 521 95 Abschnitt 6.4.2.4 erfüllt werden.

Das Bewertungsergebnis und die für eine Ölfreigabe erforderlichen Grenzwerte entnehmen Sie bitte den Anlagen.

Sollte zwischenzeitlich kein Wechsel des Kraftstoffbatches stattfinden, so endet der Anerkennungszeitraum am 10.04.2010.

Mit freundlichen Grüßen

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