CEC 2010 - Role of CEC in Developing Tests for the European Automotive Industry

Derek Mackney – CEC Chairman of the Board
CEC Chairman – Derek Mackney

Derek Mackney is quite well known in the European Lubricants industry as he has been involved in ATC and CEC committees for many years.

Professionally his early years were spent with Ford at their UK Research and Engineering Centre. He has worked for Lubrizol at their Technical Centre near Derby in the UK for the last 24 years. He is presently Senior Technical Manager for Engine Oils, responsible for OEM liaison, Engine Oil approvals and Industry Committee representation.

He is chairman of the ATC group that manages the ATC Code of Practice.

From the 1st January 2010 he has taken on the role of Director and Chairman of the CEC Management Board.

Derek obtained his Engineering qualifications and Business Degree from North East London Polytechnic. He also has a Masters degree from Lancaster University. He has written and co-authored a number of technical papers for SAE, ASTM, CEC and other bodies and is co-inventor on a number of patents.
What is CEC?

The Co-ordinating European Council for the development of performance tests for transportation fuels, lubricants and other fluids

CEC is an Industry-based organisation for the development of Test Procedures and Methods:

- Automotive Fuels, Engine Oils & Transmission Fluids
- Marine & Large Engine Oils
- Two-stroke Engine Oils
- Associated Bench Tests
- Industrial & Hydraulic Fluids
The Coordinating European Council (CEC) for the Development of Performance Tests for Fuel, Lubricants and other Fluids

CEC was reorganised in 2001. Its Board of Directors is made up from members of four Industry Associations:

1. ACEA: www.ACEA.be
   Association des Constructeurs Europeens de l’Automobile

2. ATC: www.ATC-Europe.org
   ATC is the Organisation of Europe’s biggest additive manufactures

3. ATIEL: www.ATIEL.org
   ATIEL is the Organisation of Europe’s leading engine oil manufactures

4. CONCAWE: www.concawe.be
   The Oil companies’ European association for environment, health and safety in refining and distribution
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CEC Organisation
ACEA European Oil Sequences and EELQMS

In 1995 the European industry associations ACEA, ATC and ATIEL developed a quality system to ensure that engine lubricants claiming performance against the ACEA Oil Sequences would have been developed and tested according to best industry practices. This system is called the “European Engine Lubricant Quality Monitoring System (EELQMS)”

There are 4 major parts:
1. ACEA European Oil Sequences
2. ATC Code of Practice
3. ATIEL Code of Practice
4. CEC test methods
CEC’s role in EELQMS

1. ACEA Oil Sequences
   - Definition of quality requirements

2. CEC test methods
   - Quality of Test Methods
   - Data in ERC database
   - Maintaining quality in production

3. ATC Code of Practice
   - Quality of product approval

4. ATIEL Code of Practice
   - In production
CEC Mission

Managed by industry stakeholders

Quality processes for test labs

TMS for bench tests

Rating workshops

Use of lead lab to develop new tests

Support of statistics group

Terms of reference for new test development

Monitoring and referencing of test engines

Expert fuels and lubes advisors

All CEC processes combine to provide high quality tests that will reliably assess the true performance of a lubricant or fuel
CEC Test Methods

Engine Oils – Passenger Cars

- CEC L-38-94 - Gasoline Engine Valve Train Scuffing Test (PSA TU3 Engine)
- CEC L-53-95 - Evaluation of Sludge in Gasoline Engines (MB M111 E20)
- CEC L-54-96 – Fuel Economy Effects of Engine Lubricants (MB M111 E20)
- CEC L-78-99 – DI Diesel Ring Sticking & Piston Cleanliness Test (VW 1.9L Turbocharged)
- CEC L-88-02 - Evaluation of Oil Viscosity Increase, High Temperature Deposits & Ring Sticking in Gasoline Engines (Peugeot TU5 JP+)
- CEC L-93-04 - Oil Dispersion Test at Medium Temperature for Passenger Car Direct Injection Diesel Engines

Engine Oils – Heavy Duty Diesel

- CEC L-101-09 - Piston Cleanliness and Bore Polishing Test (OM 501LA)

Engine Oils – Light & Heavy Duty Diesel

- CEC M-100-09 - Code of Practice Turbo Deposits
- CEC L-99-08 – Evaluation of engine crankcase lubricants with respect to low temperature lubricant thickening & wear under severe operating conditions (OM646LA)
CEC Test Methods

Automotive Fuels

- CEC F-05-93 - Inlet Valve Cleanliness in the MB M102E Engine
- CEC F-16-96 - Assessment of the Inlet Valve Sticking Tendency of Gasoline Fuels (VW Waterboxer Gasoline Engine)
- CEC F-20-98 - Deposit Forming Tendency on Intake Valves.
- CEC F-23-01 - Procedure for Diesel Engine Injector Nozzle Coking Test (PSA XUD9A/L 1.9 Litre 4 Cylinder indirect injection diesel engine)
- CEC F-98-08 - Direct Injection, Common Rail Diesel Engine Nozzle Coking Test.
- CEC M-92-03 – Code of Practice - Engine Non-Start Problems Relating to CCD Flaking (CCDs = Combustion Chamber Deposits)
CEC Test Methods

Bench Tests

- CEC L-14-93 - Shear Stability of Lubricating Oils Containing Polymers (Fuel Injection Pump)
- CEC L-36-90 - The Measurement of Lubricants Dynamic Viscosity, High Shear
- CEC L-39-96 - The Evaluation of Oil - Elastomer Compatibility (Laboratory Test)
- CEC L-40-93 - Evaporation Loss of Lubricating Oils (NOACK Evaporative Tester)
- CEC L-48-A-00 - Oxidation Stability of Lubricating Oils used in Automotive Transmissions by Artificial Ageing (Laboratory Test)
- CEC L-82-97 - Spectrophotometric determination of Soot in Used Engine Oil
- CEC L-83-97 - Measurement of Kinematic Viscosity @100 Deg C of Used Oil Samples
- CEC F-06-96 - Measurement of Diesel Fuel Lubricity (HFRR fuel lubricity tester)
CEC Test Methods

Transmission Fluids

- CEC L-07-A-95 - Load Carrying Capacity Test for Transmission Lubricants (FZG Test Rig)
- CEC L-45-99 - Viscosity Shear Stability of Transmission Lubricants (Taper Roller Bearing Rig)
- CEC L-66-99 - Evaluation of the Synchromesh Endurance Life using the FZG SSP 180 synchromesh test rig
- CEC L-84-02 - FZG Scuffing Load Carrying Capacity Test for High EP Oils
CEC Test Methods

Marine & Large Engine Oils

- CEC L-94-10 Determination of Asphaltenes in Used Engine Oil
- CEC L-47-M-97 (U) - Recommended Standard Methods for Analysis of Used Oil from Large Diesel Engines (including CEC M-12-T-91 Sampling of Engine Lubricants on Board Ship)

Two-Stroke Engine Oils

- CEC L-33-A-93 (U) - Biodegradability of Two-Stroke Cycle Outboard Engine Oils in Water

Reference Fluids Manuals

- CEC P-017-97 - Reference Fuels Manual.

(U) Unsupported – no longer supported by a CEC Group
CEC Secretariat

Website: [www.CECtests.org](http://www.CECtests.org)

- Secretarial & administrative support to Management Board
- Finance, Legal and Accounts
- Support to all CEC Groups
- Maintenance, updating and sales of Test Methods
- Maintenance of CEC’s secure Web Site and information to stakeholders.
- TMS facilitator
- Helpdesk facility
- Organisation of CEC Conferences
The Coordinating European Council
for the Development of Performance Tests for Fuel, Lubricants and other Fluids

CEC - Website: www.CECtests.org
Test Laboratory Quality Requirements

All laboratories running CEC tests must have an ISO 9001 equivalent system for the general quality definition and procedures.

For engine/rig tests an ISO 17025 equivalent system is required.

Laboratories must actively participate in CEC Group activities, meetings and round robins. E.g., every laboratory must contribute to the improvement of the test method and share data/experience.
Test Laboratory OEM Quality Requirements

Especially for lubricant engine tests included in the ACEA Oil Sequences additional requirements must be satisfied:

- Audit by supporting OEM
- Confidentiality agreement with OEM

These requirements may exclude laboratories not meeting the “standard” required by CEC and the supporting OEM.
CEC Web-based Test Monitoring

- Simple process for uploading Reference data and Graphical software for analysis of data

- Location: www.cec-tms.net
ERC – ATC's European Registration Centre
https://atc-erc.org

- Candidate test registration database
- Reference test registration database and charting

Welcome to the ATC European Registration Centre. This website provides information related to engine testing conducted in accordance with the ATC Code of Practice.

The Technical Committee of Petroleum Additive Manufacturers in Europe (ATC), with input from EELQMS, the European Engine Lubricants Quality Management System, has established standards in the field of engine lubricants in service and has developed a whole process of testing and reporting for ACEA claims, when marketing lubricants.

Please contact Jeff Clark at ATC-Europe Registration Centre with any questions.

ERC Web Alerts:

- Updated ATC Code of Practice is
- See ERC Memo 2010
- Letter of Intent Due April
- See ERC Memo 2010

Data Range of Results: 2000-00-00 to 2000-00-00
Support Groups

- **Statistical Development Group - SDG**
  - A designated Statistical Development Liaison Officer allocated to each Group
  - Assuring Quality of Test Results

- **Rating Group - RG**
  - Regular Workshops for Raters
  - Ensure Rating is consistent across the industry

- **Reference Fuels Group - RFG**
  - A suite of reference fuels are supplied for use within TDG and SG test groups to ensure consistency of fuel used.

- **Reference Oils Group - ROG**
  - Reference oils are supplied to TDG and SG test groups to enable the initial development of tests using calibration oils and to ensure correct severity of testing by running Round Robins and/or set reference frequency protocols.
Recent Test Developments

- CEC F-98-08 – Injector Fouling in Direct Injection Diesel Engines (DW10)
- CEC L-99-08 – Diesel Engine Wear Test (OM646LA)
- CEC L-101-09 - Piston Cleanliness and Bore Polishing Test (OM 501LA)
- Turbo Deposits Test - Code of Practice
- CEC L-94-10 Determination of Asphaltenes in Used Engine Oil

New Developments

- TDG-L-103 – Biological Degradability
- TDG L-104 - Effects of Biodiesel Fuel (March 2010)
- TDG L-105 - Low Temperature Operability Test
- CEC L-93-04 - Oil Dispersion Test at Medium Temperature for Passenger Car Direct Injection Diesel Engines - Replacement test using an Euro 5 engine is under discussion
CEC L-99-08 - Diesel Engine Wear Test (OM646LA)

- Replacement for OM602A in ACEA and for OM611LA in Mercedes-Benz (MB) in-house specifications
- Cam wear is main parameter for ACEA.
- MB parameters include – Piston merits, Cylinder, Ring, Timing chain and
- Bearing wear, Viscosity increase, Bore polishing and Engine sludge
- B5 Biodiesel used
- 300 hours cyclic test

OM 646 LA - Euro V
- Engine type: R4 CDI
- Capacity: 2.2 l
- Power max: 110 kW
- Torque max: 340 Nm
CEC L-101-09 - Piston Cleanliness and Bore Polishing Test (OM 501LA)

- Replacement for OM441LA in ACEA and Mercedes-Benz (MB) specifications
- Piston merit is main criteria for ACEA
- MB parameters include - Engine sludge, General engine deposits, Bore polishing, Cylinder wear, Ring sticking and Oil consumption.
- B5 Biodiesel used
- 300 hours cyclic test

OM 501 LA - Euro V
- Engine type: HDD V6
- Capacity: 11.9 l
- Power max: 350 kW
- Torque max: 2300 Nm

Terms of Reference for TDG-L-104

- 1st meeting: 12th March 2010

- New Biodiesel test to determine the effects on Piston deposits, Engine Sludge and Oil degradation.

- Using the same Daimler AG OM 646 DE 22 LA engine as used in CEC L-099.

- Test Fuel - B15 = 85% Diesel Fuel + 15% FAME

- Test Oil will be diluted with ≈ 7% B100

OM 646 LA - Euro V
- Engine type: R4 CDI
- Capacity: 2.2 l
- Power max: 110 kW
- Torque max: 340 Nm

Terms of Reference for TDG-L-105

- Development of an bench test which simulates low temperature pumpability problems observed in the field during the cold Winter of 2008/2009
- ISP selected by tender as the Lead Laboratory
- TDG will evaluate low temperature pumpability (as measured by MRV) of engine oil dosed with biofuel and aged in laboratory glassware. The initial phase of the test development will include an investigation phase. It’s expected that the following factors will be investigated:
  - Test hardware and type: GFC or Daimler
  - Modifications to current GFC oxidation and Daimler oxidation methods
  - Fuel type (B15 or B100)
- First meeting 15th December 2010
Potential Future Test Developments

- Updated Engine for DV4 - CEC L-93-04
- New Gasoline Sludge Test, replacing the M111.
- New Fuel Tests under consideration.
- New Fuel Economy test
On behalf of the CEC Management Board,

Thank You

for visiting us today.