WP.29 regulatory activities having a direct impact on air pollution

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Working Party on Brakes and Running Gear

Working Party on Brakes and Running Gear (GRRF)
- Founded ~ 40 years ago
- Regulating active safety
- Regulates (among others) the construction of tires and their safety

Tires and the environment:

GRRF defined:
- Tire test procedure
  - Safety aspects
  - Environmental aspects
    - Tire rolling resistance
    - Tire Pressure Monitoring Systems
      (Deflated tires = more pollutant emissions)

Active safety systems:

GRRF is monitoring new technologies:
- e.g. Platooning
- (see presentation on ITS)
Working Party on Pollution and Energy (GRPE)
- Founded ~ 40 years ago
- Regulating emissions of:
  - Passenger cars and light vehicles \((EIF \text{ of } UN \text{ Reg. No. } 83: \text{1989})\)
  - Trucks and buses/coaches \((EIF \text{ of } UN \text{ Reg. No. } 49: \text{1982})\)
  - Motorcycle and mopeds
  - Non-Road Mobile Machineries

- Set the following requirements:
  - Standard emission test
  - Idle emission test (correspond to PTI test)
  - Crankcase emissions
  - Evaporative Emission Test
  - Endurance test \((\text{up to } 700.000km)\)
  - Cold start test by \(-7 \, ^\circ C\)
  - In Use Conformity
  - On-board diagnosis (OBD)
GRPE - The regulatory work

- Under the 1958 Agreement:
  
  • UN Regulations Nos. 83 and 101 (Pollutant and CO2 emissions of passenger cars (light vehicles)
  • UN Regulation No. 49 (Emissions of heavy Trucks and Buses/coaches)
  • UN Regulation No. 96 (Emissions of Agricultural vehicles and Non-road mobile machinery)
  • UN Regulation Nos. 40 and 47 (Pollutant emissions of motorcycle and mopeds)
  • ...
  • UN Regulation No. 132 (Retrofit emission control devices)

- Under the 1998 Agreement

  • GTR No. 2 on WMTC (Test cycle for Motorcycles)
  • GTR No. 4 on WHDC (Heavy Duty Vehicle Emission)
  • GTR No. 5 on WWH-OBD (Worldwide harmonized OBD)
  • GTR No. 10 (HDV Off cycle emissions)
  • GTR No. 11 (Emissions of agricultural and forestry tractors and NRMM)
  • GTR No. 15 (WLTP)
GRPE - The figures

Emission limits reduction up to -98%

For passenger cars

For heavier vehicles, such as trucks, coaches and busses
GRPE encouraged the introduction of new emission reduction technologies

- Implementing lower limit values:
  - DPF, SCR and NOx after-treatment

- NEDC test cycle:
  - EGR, Stop-Starts and Gear shift indicator

- Defining accurate coast down test:
  - Tire rolling resistance and aerodynamics
Limit values:

Simultaneous NOx and PM limit values reduction forced the introduction of DPF and NOx after treatment
Coast down

To better measure the emission of vehicles on dynamometers, the proper rolling behavior of the vehicle is simulated on the test bench.

A realistic testing procedure encouraged the automotive industry to optimize:

- Rolling resistance
- Aerodynamics
- Mass

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GRPE - the limits

Implementation of the latest emission regulations, consider retrofit and fleet renewing measures.

Good fuel quality necessary for technologies to be marketed and work in a reliable fashion (Clean fuel with low sulfur contain and adequate additives).

The modal shifting to be organized avoiding sub-optimal vehicle operation modes.
Status of New European Driving Cycle (NEDC)

- NEDC didn’t change since decades:
  - ECE-15 (city) pattern repeated 4 times and EUDC (highway)
  - Robust and reliable measuring cycle
  - Reference for many Countries incl. those not CP to the 1958 Agreement (e.g. Mauritius)

- Vehicles and engines very much regulated
- They are developed according to the specifications of the Regulations
  - Powertrains often don’t bring more than what is legally requested
  - NEDC became instrumental for the implementation of environmental policies

- Experts complains: NEDC not representative enough of real driving, especially the Fuel Economy / CO2 emission measures would be too low

- So the work on WLTP started
THANK YOU VERY MUCH FOR YOUR ATTENTION

World Forum WP.29


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NEDC encouraged introduction of innovations

Euro 2

\[ V_{\text{max}} = 120 \text{ km/h} \]
\[ V_{\text{trop}} = 92.5 \text{ km/h} \]
\[ t = 1,220 \text{ s} \]
\[ d = 11,000 \text{ km} \]

Euro 3/4/5/6

New European Driving Cycle (NEDC)

Part One - Urban
Part Two - Extra Urban

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NEDC encouraged introduction of innovations

The 40 s delay deletion introduced with Euro 3 promoted innovations such as Exhaust Gas Recirculation (EGR) and bigger catalyzer.
NEDC encouraged introduction of innovations

Euro 3/4/5/6

The defined decelerations “promoted” the introduction of overrun fuel cutoff systems

The idle phases “promoted” the introduction of Stop-Starts systems
Partager les approches et les méthodes pour une vision commune

Pour un spécialiste de la pollution
- Capteurs de mesure de la qualité de l'air
- Trafic important, les moteurs de voitures génèrent trop de pollution
- Moderniser le parc automobile
- Les zones 30 augmentent la pollution

Pour un spécialiste des transports
- Évolution technologie insuffisante
- Enquêtes ménages déplacements pour mesurer les parts modales
- Part de marché de la voiture trop importante
- Développer les modes alternatifs à la voiture et le report modal
- Les zones 30 diminuent la pollution

- Et tous les 2 ont raison!
- Nécessité d’avoir un thermomètre unique pour des diagnostics partagés et des traitements adaptés
Initiative: Reducing Black Carbon Emissions from Heavy Duty Diesel Vehicles and Engines

- Works to reduce the climate and health impacts of black carbon and particulate matter (PM) emissions in the transport sector
- An estimated 19% of global black carbon emissions from transportation sector
- Heavy-duty diesels are a major source of fine PM emissions (PM 2.5 or less)
- These particles are responsible for 3.2 million early deaths worldwide per year
- On vehicles without a diesel particulate filter, BC accounts for 50-80% per cent of PM

Heavy-duty Diesel Initiative: Structure and Work

- **Co-leads:** US, Canada, ICCT and UNEP
- **Partners:** Mario Molina Center Chile, Smart Freight Center, Clean Air Asia, Natural Resources Defense Council
- **Objective:** To virtually eliminate fine particles and black carbon emissions from new and existing heavy duty diesel vehicles and engines (including marine vessels) by:
  - Steadily reducing sulfur in diesel fuel...
  - Establishing more stringent emission standards with interested nations and parties...
  - Cleaning up existing fleets...
  - Cleaning up ports and marine transport
  - And developing a global Green Freight initiative

Countries World-Wide are Introducing Low Sulfur Diesel

- Major improvements in all regions
- First developing countries with ULSO
  - But much to be done and need to speed up

CCAC Clean Fuels and HDD Support East Africa

- June 2013: East African Community Decision for 50 ppm diesel and 150 ppm petrol
- September 2013: Kenya refinery is shut down
- December 2013 EAC harmonizes standards - effective January 2015
- East Africa first non-OECD sub-region to adopt low sulfur fuels

Clean Diesel Latin America, 2013 - 2015

- Development of HDD emission standards, Chile
- Black Carbon Inventory, Chile
- Clean Diesel Strategy, Peru
- Regional fuel quality and diesel standards harmonization through Latin America Environmental Ministers Forum
- Diesel filter demonstration, retrofits in Lima, Montevideo, Santiago de Chile

HDD Initiative Plans 2014 +

- Expand CCAC developing country membership in all regions, especially East Europe
- Complete low sulfur fuels transition: West Africa, Southern Africa
- Low sulfur adoption in Mexico City, Beijing
- Diesel retrofits programs in Latin America: Mexico City, Lima, Montevideo, Santiago de Chile
- Expand ports work in Asia, Africa, Latin America