Consistent low NOx emissions on the road - Reality with modern diesel vehicles

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Exhaust emissions control technologies for original equipment, retrofit and aftermarket for all new cars, commercial vehicles, motorcycles, and non-road mobile machinery

AECC is # 78711786419-61 in EU Transparency Register and has consultative status with the UN Economic and Social Council (ECOSOC)
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RDE legislation has improved real-world NOx emissions

- RDE entered into force on 1 September 2017 with Euro 6d-temp type-approval
- RDE requirements ensure that emissions are controlled over a wider range of driving conditions
RDE legislation has improved real-world NOx emissions

On-road emissions of Euro 6d-Temp diesel vehicles are well within standards
RDE legislation has improved real-world NOx emissions

Reduction confirmed by independent testing
Light-duty diesel emissions control technology evolution
Towards combination of technologies in a compact design for RDE compliance

Source: Audi – Vienna Motor Symposium 2019
Source: Hyundai – Vienna Motor Symposium 2019
Objective: demonstrate consistent low NOx emissions

- Low speed/load  
  e.g. city driving
- High speed/load  
  e.g. motorway driving
- Transients

More details:  
Vehicle and powertrain characteristics

- **Vehicle**
  - C-segment
  - 1700 kg

- **Drivetrain**
  - Manual gearbox, 6-speed
  - 48 Volt mild-hybrid

- **Engine**
  - 1.5l, 4-cylinder, 2-valve
  - Exhaust Gas Recirculation (EGR)

- **Euro 6b type-approval (LNT + DPF)**
Emissions control technologies on demonstrator car

LNT + dual-SCR to cover wide range of driving conditions

cc: close-coupled
LNT: Lean NOx trap
SCR: Selective Catalytic Reduction
DPF: Diesel Particulate Filter
SDPF: SCR on DPF
uf: underfloor
ASC: Ammonia Slip Catalyst

Temperature downstream turbine
Consistent low NOx emissions were achieved

![Graph showing NOx emissions vs. average vehicle speed in km/h. The graph includes data points for different regions and conditions, such as TFL, RDE urban, WLTC, NEDC, and RDE total. There are two dashed lines indicating the Euro 6d-temp Not-to-Exceed limit and the Euro 6d Not-to-Exceed limit. The graph shows a trend where emissions increase with average vehicle speed.]
All aftertreatment components contribute to NOx control

- City driving: LNT and close coupled SCR+SDPF
- Motorway driving: underfloor SCR required to secure robust emissions control
Other approaches are available to achieve low NOx

- Bosch [1]: DOC + dual-SCR
- FEV [2]: DOC + dual-SCR
- Continental [3]: eDOC + dual-SCR

3. G. Avolio, et al.; “Super Clean Electrified Diesel: Towards Real NOx Emissions below 35 mg/km”, 27th Aachen Colloquium, 2018
Conclusions

- RDE requirements have ensured better control of NOx emissions under most EU driving conditions – these Euro 6d-temp cars are on the road today.

- Independent testing confirms low emissions of RDE compliant vehicles.

- AECC-IPA-IAV demonstrator car shows that diesel NOx emissions can be kept at a very low level in a consistent way, over a wide range of driving conditions.

- This is achieved by combining existing catalyst technologies with improved emissions control functions supported by hybrid technology.
Diesel Information Hub

https://dieselinformation.aecc.eu (now available in EN, FR, ES, IT; DE expected)
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