Joint Conference on
SMART CO$_2$ REDUCTIONS
Non-product Measures for Reducing Emissions from Vehicles
Turin, 2-3 March 2000

Session 1: The Driver

The importance of Maintenance and ensuring it gets done
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Influence and Importance of
motor vehicle testing,
motor vehicle maintenance and
driver behaviour
in reducing CO$_2$ emissions
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Corporate Development and External Relations
DEKRA - Our services:

- Vehicle inspection 60%
- Automotive loss adjusting and claims management 25%
- Homologation and type approval
- Accident analysis and research
- Materials testing and construction certification
- Training 10%
- Environmental services
- QM - consulting and certification
- Fleet management
- Publications
Influences on CO$_2$ Emissions

**Factors**

- Driving behaviour

- *periodic testing/servicing*
  - Engine
  - Transmission line
  - External Travelling resistance (e.g. rolling resistance)
Driving behaviour - Influence of driver

**Driving behaviour**
- low revs at maximum torque
- anticipation
- no unnecessary idling
- selection of optimal speed

**WATCHING OUT FOR ANYTHING UNUSUAL**
- excessive fuel consumption
- noise
- black smoke from the exhaust

**ORGANISATION**
- route planning /rest periods
- avoiding unnecessary empty running
- no carrying of ballast

**INSPECTION IN ROTATION**
- Safety testing
- General testing
- Exhaust emission testing

**SERVICING AND MAINTENANCE**
- regularly
- systematic
- Driver carries out small technical jobs himself

**OPTIMUM TECHNICAL CONDITION**
- Engine
- Tyres
- Fuel and lubricant quality

Driver‘s influence on CO² emissions
Driving behaviour - Requirements for drivers

Qualification and attitude requirements for drivers

1. Specialised knowledge
2. Co-operative attitude and preparedness to take action
3. Proficiency in making small repairs if necessary
4. Punctual requests for vehicle testing and servicing, and immediate recourse to the repair shop if he cannot rectify the defect himself
Driving behaviour - Environmentrelated requirements for driver training and testing

Extract from the Federal Republic of Germany’s Road Traffic Law (§2, Section 5):

“A person is fit to drive a motor vehicle... If he/she has adequate knowledge of environmentally conscious and energy-saving driving techniques and is in a position to put them into practice.“

The theoretical and practical test is designed to provide proof of this knowledge
Percentage of defects in exhaust emission testing in Germany

<table>
<thead>
<tr>
<th>Year</th>
<th>Electronic Catalytic Converter</th>
<th>Diesel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>83.4% passed</td>
<td>16.6% failed</td>
</tr>
<tr>
<td>1997</td>
<td>82.9% passed</td>
<td>18.0% passed</td>
</tr>
</tbody>
</table>

The chart shows the percentage of defects in exhaust emission testing in Germany for electronic catalytic converters and diesel engines in 1994 and 1997. The data indicates a decrease in failures and an increase in pass rates over the years.
Percentage of defects in exhaust emission testing in Germany

Vehicles with electronic catalytic converter

The overwhelming majority of the defects revealed by the exhaust emission test are also relevant to CO$_2$ emissions
## Percentage of defects in exhaust emission testing in Germany

Percentage of vehicles with an electronic catalytic converter with defects in the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust system</td>
<td>7.9%</td>
</tr>
<tr>
<td>Induction system</td>
<td>1.4%</td>
</tr>
<tr>
<td>Catalytic converter</td>
<td>1.0%</td>
</tr>
<tr>
<td>Lambda probe</td>
<td>1.7%</td>
</tr>
<tr>
<td>Exhaust gas recirculation system</td>
<td>0.2%</td>
</tr>
<tr>
<td>Secondary air system</td>
<td>0.2%</td>
</tr>
<tr>
<td>Other defects</td>
<td>1.3%</td>
</tr>
<tr>
<td>Ignition point</td>
<td>0.7%</td>
</tr>
<tr>
<td>Idling revs</td>
<td>1.0%</td>
</tr>
<tr>
<td>CO value (idling)</td>
<td>1.4%</td>
</tr>
<tr>
<td>CO value (fast idling)</td>
<td>2.3%</td>
</tr>
<tr>
<td>Lambda value</td>
<td>2.1%</td>
</tr>
<tr>
<td>Servoloop</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

There may be a defect in more than one of the above.
Percentage of defects in exhaust emission testing in Germany

Diesel vehicles

- Passed exhaust emission test: 82.0%
- Limiting value exceeded: 6.0%
- Defective on visual inspection: 8.0%
- Tuning values defective: 4.0%

Some of the defects revealed by the exhaust emission test are also relevant to CO₂ emissions.
Percentage of defects in exhaust emission testing in Germany

Percentage of diesel vehicles with defects in the following:

- Exhaust system: 6.2%
- Induction system: 1.5%
- Exhaust gasretreatment system: 0.2%
- Other defects: 2.4%
- Idling revs: 1.7%
- Speed regulation revs: 2.3%
- Limiting value exceeded: 6.0%

There may be a defect in more than one of the above.