A New Standard

An overview of WLTP for passenger cars and light commercial vehicles
Ladies and Gentlemen,

“Transformation” is the topic of the hour: the automotive industry is undergoing a process of fundamental upheaval – and not just in terms of drive technologies and digitalization. From autumn this year the entire industry will face another important change: the successive introduction of the WLTP test cycle for passenger cars and light commercial vehicles.

What does this term refer to? Put simply: a new standardised procedure for measuring consumption and emissions that was agreed by the EU member states in the summer of 2016. It is intended to provide customers with a more realistic image of a vehicle’s fuel consumption and emissions. The WLTP includes many more acceleration and braking processes than the “old” NEDC; at the same time the requirements for the test rig test have been made even more stringent.

For you as a fleet customer the WLTP means more transparency. This is the first time that a measuring procedure also includes certain optional equipment that can affect consumption and emissions. These values will be displayed in future while the vehicle is configured – and this can provide additional assistance when you are setting up your fleet.

The important thing is that the WLTP does not affect vehicles that have already been registered. The procedure will be introduced step by step and is currently relevant to new type approvals for carmakers. Only in the autumn of 2018 will all vehicles made in the EU have to be certified according to the WLTP.

Though the details have not yet been resolved at national level, we want this brochure to provide the most comprehensive information possible about the new measuring procedure. It describes the reasons for the WLTP, the test procedure, and the improvements when compared to existing measuring procedures. We have also collated some central questions and answers for you that are relevant to fleets.

Kind regards

Fred Kappler
Leiter Volkswagen Konzern Vertrieb
The NEDC is on the way out, and WLTP is taking its place. From September 2017 many countries will replace existing test procedures for determining fuel consumption and emissions successively with the Worldwide harmonized Light vehicles Test Procedure (WLTP).

The name of this new test procedure for passenger cars and light commercial vehicles may seem a bit of a mouthful at first, but it offers a whole series of tangible benefits. Not only do its standardised driving profiles and measuring procedures allow better comparisons, the WLTP test structure is also designed to depict consumption and emission values in a considerably more realistic way. In November 2007 experts from the European Union, Japan and India began to develop the WLTP according to UNECE guidelines (United Nations Economic Commission for Europe). They used driving data collected around the world as their basis. Introduction will take place incrementally from September 2017 in the EU-28 countries, Norway, Iceland, Switzerland, Turkey, Israel, in modified form in Japan, and for exhaust emissions in China. India and South Korea will also implement the WLTP at a later stage.
What are the advantages of WLTP over earlier test procedures? Central improvements in the new test cycle can be illustrated by comparing it to the NEDC, for example, which has been applied in the EU since 1997. Both methods involve placing the vehicle on a dynamometer in laboratory conditions – but the boundary conditions and specifications for the WLTP are stricter.

**Influencing factors:**

**Speed**
As part of the WLTP, the driving pattern has a higher average speed and a higher top speed.

**Dynamics**
The WLTP involves considerably more acceleration and braking processes. Travel at constant speed as found in the NEDC takes place for only a few seconds.

**Vehicle equipment**
Unlike the NEDC, the WLTP also includes special and additional equipment that can affect consumption and emissions; a vehicle’s CO₂ value must be displayed to the customer as he or she fixes a configuration. Special equipment such as air conditioning and auxiliary heating remain switched off in both test procedures, but they could affect the WLTP result due to their weight.

**COMPARISON NEDC/WLTP**

<table>
<thead>
<tr>
<th></th>
<th>NEDC</th>
<th>WLTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting temp.</td>
<td>cold</td>
<td>cold</td>
</tr>
<tr>
<td>Duration</td>
<td>1.180 sec.</td>
<td>1.800 sec.</td>
</tr>
<tr>
<td>Idle time</td>
<td>25 %</td>
<td>13 %</td>
</tr>
<tr>
<td>Distance</td>
<td>10.966 m</td>
<td>23.274 m</td>
</tr>
<tr>
<td>Phases</td>
<td>2 phases: Urban and long-distance trip</td>
<td>Up to 4 phases: “Low”, “Medium”, “High” and “Extra-High”</td>
</tr>
<tr>
<td>Speed</td>
<td>mean: 34 km/h – maximum: 120 km/h</td>
<td>mean: 47 km/h – maximum: 131 km/h</td>
</tr>
<tr>
<td>Acceleration</td>
<td>mean: 0.50 m/s² – maximum: 1.04 m/s²</td>
<td>mean: 0.39 m/s² – maximum: 1.58 m/s²</td>
</tr>
<tr>
<td>Influence of extra features</td>
<td>Currently not included</td>
<td>Special equipment is included (weight, aerodynamics)</td>
</tr>
</tbody>
</table>
The WLTP was developed with the intention of recording consumption and emission values as realistically as possible. The result is a driving cycle that lasts around 30 minutes and is intended to produce representative results by including driving data from various different countries and relating to everything from acceleration behaviour to stationary periods.

**Practice: The cycle phases**
Depending on their power-to-weight ratio class, vehicles run through various cycle phases while on the test rig. They are characterized by parameters such as average speed, distance or duration.

### WLTP Cycle Phases in Detail

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Extra-High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>ca. 3 km</td>
<td>ca. 5 km</td>
<td>ca. 7 km</td>
<td>ca. 7,7 km</td>
</tr>
<tr>
<td>Duration</td>
<td>156 sec</td>
<td>433 sec</td>
<td>455 sec</td>
<td>323 sec</td>
</tr>
<tr>
<td>Idle time</td>
<td>26 %</td>
<td>11,1 %</td>
<td>6,8 %</td>
<td>2,2 %</td>
</tr>
<tr>
<td>$V_{\text{max}}$</td>
<td>56,5 km/h</td>
<td>76,6 km/h</td>
<td>97,4 km/h</td>
<td>131,3 km/h</td>
</tr>
<tr>
<td>$V_0$</td>
<td>25,7 km/h</td>
<td>44,5 km/h</td>
<td>60,8 km/h</td>
<td>94,0 km/h</td>
</tr>
</tbody>
</table>
The new WLTP will be introduced incrementally in the European Union. Passenger cars and light commercial vehicles are subject to different deadlines.

**WLTP for passenger cars**

The first deadline for the WLTP in the passenger car area will be 1 September 2017. From this date, type approval of new models will require consumption and CO₂ emission values to be measured in the WLTP. On 1 September 2018 the WLTP will then apply to all new vehicles – so also for ongoing models that received type approval on the basis of the NEDC. As a result, manufacturers must label these vehicles with WLTP values from this point in time.

**WLTP for light commercial vehicles**

The deadlines in this segment are a little more generous. From 1 September 2017 the WLTP will apply only to newly developed vehicles in category N1 class I, i.e. models with a reference mass of less than 1,305 kg. From 1 September 2018 it will apply to all new registrations in category N1 class I. The reference mass is comprised of the empty mass of a vehicle plus 75 kg (for the driver), 100 percent operating liquids, a 90 percent tank filling and an additional 25 kg. From 1 September 2018 manufacturers will have to provide WLTP values for newly developed light commercial vehicles in category N1 classes II and III. From 1 September 2019 this will apply to all models in the commercial vehicle sector.

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*Vehicles of classes II and III in category N1, and category N2. Category N1 class I light commercial vehicles are subject to the same dates as Passenger Cars.*
Basic information about WLTP
Questions and answers for fleet customers

To whom is the WLTP relevant?
WLTP is a legally binding registration requirement and applies to all manufacturers.

In which European countries will the WLTP be introduced?
WLTP will be introduced in the EU-28 countries, Norway, Iceland, Switzerland (and Liechtenstein), as well as Turkey and Israel who both apply the EU-convention.

How does the WLTP affect vehicles in my fleet that are already registered?
The general rule is: vehicles that are already registered will not be affected by the switch to the WLTP. During the first step of its introduction beginning on 1 September 2017, the WLTP will first be relevant to new type approvals; manufacturers need to apply for such approval from the responsible authorities before they can put a vehicle on the market or make major technical changes to a model. From 1 September 2018 the WLTP guidelines will be mandatory for all new registrations.

What kind of tax implications will the WLTP have for my fleet?
In many countries, vehicle taxes are based partly on a vehicle’s CO₂ emissions. As yet (April 2017) it is unsettled how the new test procedure will affect this rule; the matter is still being resolved in the various domestic legislations.

The WLTP includes optional equipment for the first time. Why?
Optional equipment can change a vehicle’s weight or aerodynamics and thereby affect consumption and emissions. In future, customers configuring a vehicle will be able to see how the vehicle’s CO₂ value changes when optional equipment is added.

Will the introduction of the WLTP mean a precise match between the value determined in the lab and actual driving consumption values?
In reality, a vehicle’s consumption and CO₂ emissions depend on a multitude of factors that cannot be perfectly reconstructed in the lab, even with the WLTP. Different driving styles represent a central factor here. If two drivers move identical vehicles in identical conditions in real traffic, the values are bound to differ due to individual acceleration and braking behaviour, for example.