Emission Testing of Vehicles – RDE and WLTP
Fact Sheet – October 2018

What is WLTP?

Worldwide harmonised Light Vehicles Test Procedure (WLTP) is a replacement for the New European Driving Cycle (NEDC) which was introduced in 1992. WLTP will measure a car or van's individual CO_2 value taking into account the vehicle mass, including optional equipment, tyre rolling resistance class and aerodynamics. The values obtained with WLTP are comparable worldwide, excluding China and the United States of America, whilst NEDC values are only valid in Europe.

Why is the test changing?

Air quality standards from tail pipe emissions have been the concern of citizens and governments for a number of years.

Vehicle manufacturers have been tasked with reducing pollutants that are proved to be injurious to health (carbon monoxide, hydocarbons, nitrous oxides and particulates).

The European Union introduced limits to control exhaust emissions from vehicles to improve air quality (so called real driving emissions), e.g. Euro 1 in 1993, Euro 6 from September 2015. Transport (including motor vehicles) is a major source of greenhouse gas emissions. Greenhouse gasses such as CO_2 contribute to climate change.

In addition, European regulation has set binding targets to reduce the CO_2 emissions of new cars: the target currently is 95 g/km CO_2 by 2021.

Despite these measures, although cars and vans are compliant with NEDC limits, there is a growing gap between published fuel consumption (and CO2 emissions) figures for new cars/vans and their in-life performance.

The NEDC was originally developed in the 1970's and though many modifications were made to the cycles and process, the cars/vans of today are much more sophisticated and carry many more accessories and systems which fall outside of the NEDC test.

When will WLTP be introduced?

WLTP testing will be introduced for all new car/van models requiring a new type approval number from September 2017.

It will be introduced for all cars and vans from September 2018.

During a transitional period between September 2017 and September 2020, the certificate of conformity issued by the Vehicle Certification Agency will show both NEDC and WLTP CO_2 values. This is a requirement of the labelling directive to help ensure that the motor manufacturing industry can comply with the 2020 CO_2 targets.

What is the difference between NEDC and WLTP?

Both test cycles are carried out in laboratory conditions, and the WLTP test cycle has been reformulated to be more representative of customer driving i.e. higher speeds and loads; more dynamic accelerations, fewer and shorter stop phases.

What does the new test provide?

A representative fuel consumption figure – the overall mpg (or l/100km) will be a much better estimate of what the car or vane can achieve in normal mixed driving.

Fuel consumption for 4 different typical driving conditions.

a. Low speed (City) driving (maximum 35mph)
b. Medium Speed (suburban) driving (maximum speed 50mph)
c. High Speed (A road or interurban) driving (maximum speed 60mph)
d. Extra high speed (Motorway) driving (maximum speed 81mph)

Each of these elements are based on real world driving and are representative of the acceleration/deceleration rates and speed variations experienced on roads in Europe today. Many vehicle manufacturers are now running tests using the new procedure and are starting to publish data.

Summary of Key Changes

	NEDC	WLTP
Temperature	20 – 30°C	23°C
Coastdown Procedure	Coastdown	New Coastdown Procedure, Mass definition, Tyres, Aero Equipment

Test Weight	Reference Mass	Reference Mass + Mass of optional equipment + % Payload
Phases (Sample Bags)	2	4
Pollutants	CO, NOx, THC, PM & PN	CO, NOx, THC, PM & PN plus NO_2, N_2O, NH_3, Aldehydes and Ethanol (additional pollutant timing tbc)
Gear Shifts (Manual Transmissions)	Fixed Speeds defined	Vehicle Specific, based on vehicle power, mass, gear ratios. Calculate for each car
Cycle Driven	Both	Cycle subject to Rated power to mass in running order ratio, W/kg, and its maximum velocity v_{max}, km/h.

Real Driving Emissions

The Real Driving Emissions (RDE) test procedure is for EURO 6 diesel engine vehicles. The RDE procedure will complement the laboratory based procedure to check that the emission levels of nitrogen oxides (NOx), and particle numbers (PN), measured during the laboratory test are confirmed in real driving conditions. This means that the car will be driven outside and on a real road according to random acceleration and deceleration patterns. The pollutant emissions will be measured by portable emission measuring systems (PEMS) that will be attached to the car. RDE testing will significantly reduce the currently observed differences between emissions measured in the laboratory, and those measured on road under real-world conditions, and to a great extent limit the risk of cheating with a defeat device. It is important to note the RDE test procedure is not designed to measure CO_2.

It has been agreed that car/van manufacturers must reduce the divergence between the regulatory limit that is tested in laboratory conditions and the values of the Real Driving Emissions (RDE) procedure when the car is driven by a real driver on a real road (the so-called 'conformity factor') in two steps:

- **RDE1** – In a first step, car manufacturers will have to bring down the discrepancy to a conformity factor of maximum 2.1 (110%) for new models by September 2017 (for new vehicles by September 2019).
- **RDE2** – In a second step, this discrepancy will be brought down to a factor of 1.5 (50%), taking account of technical margins of error, by January 2020 for all new models (by January 2021 for all new vehicles).

This agreement on the allowed divergence between the regulatory limit measured in real driving conditions and measured in laboratory conditions is still a significant reduction compared to the current discrepancy (400% on average).

The RDE test procedure is important with the current concerns over diesel cars and the introduction of clean air zones across the UK.

What are the tax implications of the test procedure changing?

The Government have announced that WLTP values will be used for tax purposes from April 2020. The BVRLA will be asking the Government for a clear and well signaled transitional arrangement so that members and customers can plan accordingly.

HMT's preferred option is to work with the industry, adopt a coordinated approach and inform customers of the meaning of the new cycle and the differences between WLTP and NEDC values.

Manufacturers have to produce both a NEDC figure and a WLTP figure during a transitional period. The DVLA will capture both figures, where available, from 1 September 2018. The NEDC figure will continue to be shown on the V5C until 1 April 2020 when the figure will switch to the WLTP figure.

The NEDC figure is produced by taking into account relevant NEDC test conditions: CO2MPAS + physical tests.

CO2MPAS is a backward-looking longitudinal-dynamics CO_2 and fuel-consumption simulator for light-duty M1 & N1 vehicles (cars and vans), specially crafted to *estimate and type-approve CO2 emissions* of vehicles undergoing NEDC testing based on the emissions produced during WLTP tests.

Practical Implications

Under the WLTP testing procedure optional equipment, accessories, tyre upgrades etc. are likely to add to the total CO_2 emission figure. Members need to consider what system changes will be required to ensure they can quote accurately to customers and fleet managers on vehicle choices and costs. Along with providing advice to customers on what these changes mean and why the new test is being introduced.

We recommend that BVRLA members' businesses are ready for these changes; and if you have not done so already that you begin looking at the impact of the introduction of WLTP and how your systems infrastructure needs to accommodate the change. Being mindful that we anticipate a transitional period in which both NEDC and WLTP figures need to be made available to you and to the end user drivers.

Whilst optional extras do have an impact on CO_2 today it is likely that this could be more significant under WLTP testing and therefore increase the cost and tax implications.

Members may need to consider making any disclaimer with regards to the CO_2 varying between quotation and delivery clearer on their quotation documents.

Further Information

WLTP Facts

BVRLA Fact Sheet on Company Car Tax

BVRLA Fact Sheet on Vehicle Excise Duty

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