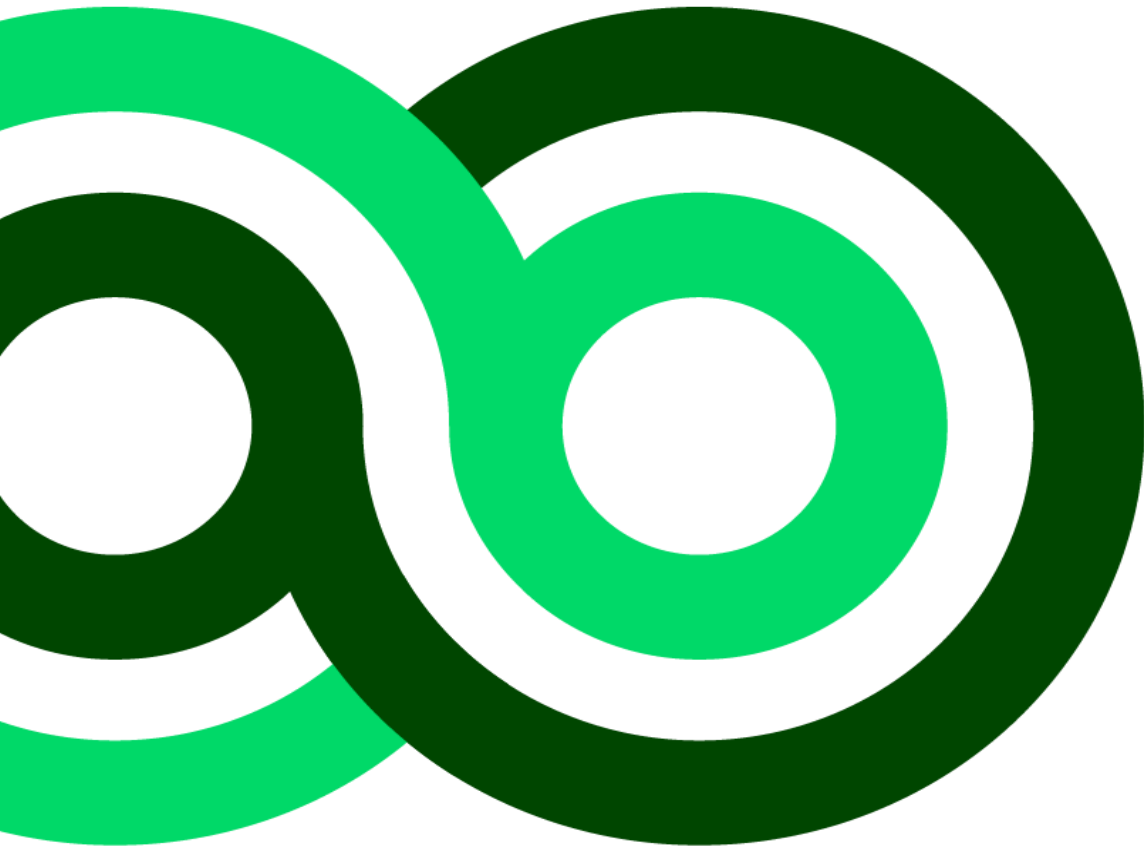


TEST PROCEDURE

Overview of Laboratory Test Sequence





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GNT Overview Laboratory Test Sequence

Preface

The Green NCAP Laboratory Test Sequences are based on GNT_WLTC+_v1.0.0. Further specifications for Green NCAP tests are to apply and are defined below.

1. General requirements

The vehicle and its components liable to affect the emissions of gaseous compounds, particulate matter and particle number shall be so designed, constructed and assembled as to enable the vehicle in permissible use and under realistic conditions of use such as humidity, rain, snow, heat, cold, sand, dirt, vibrations, wear, etc..

- 1.1 This shall include the security of all hoses, joints and connections used within the emission control systems.
- 1.2 The test vehicle shall be representative in terms of its emissions-related components and functionality of the intended production series to be covered by the approval.
- 1.3 There is no special test bench mode.
- 1.4 Measurements are performed with both vehicle axles on the test bench.

2. Vehicle testing condition

- 2.1 The types and amounts of lubricants and coolant for emissions testing shall be on maximum level and of manufacturer approved quality. This includes all fluids in the car (engine oil, gearbox oil, suspension fluids, brake fluid, windscreen wiper fluids (front and rear), refrigerant, coolant, AdBlue and the fuel tank).
- 2.2 The type of fuel for emissions testing must be reference fuel. A certificate has to prove that. By all means, the manufacturer's specifications have to be fulfilled.
- 2.3 All emissions controlling systems shall be in working order.
- 2.4 The use of any defeat device for tailpipe emissions measuring is prohibited.
- 2.5 The tyres used for emissions testing shall be original equipment manufacturer's quality. Summer tyres have to be used and the pattern depth has to be 50% minimum.

By all means, the manufacturer's specifications concerning dimensions, speed index and - if specified – brand and type, have to be fulfilled.

3. Test procedure – general

3.1 Driving Modes

Tests are carried out in three different driving modes: A best performing mode relating to energy efficiency (usually Eco-mode provided by the manufacturer) and the most inefficient mode, plus the default mode when starting the car.

Only road traffic modes (e.g. Sport, Sport+, Eco, Eco+ etc.) will be considered.

Defined Race Modes (e.g. Race, Drift etc.) shall not be applied.

The Eco-mode shall only be activated by a button or in a menu or submenu. Application of other “eco-recommendations” the manufacturer gives (like tyre pressure and so on) is not allowed.

The most inefficient mode (e.g. Sport+) shall be activated by a button or in a menu or submenu. As there’s no defined button for a most inefficient mode, it shall be activated by turning off the eco-mode.

If there is no manufacturer’s declaration, the modes will be defined by the lab. The mode selection has to be recorded in the test.

If the vehicle is not equipped with defined modes, only one WLTC_warm_default shall be performed.

3.2 Weight

All vehicles are tested their actually measured weight:

The equation for the test mass TM is as shown:

$$\text{Test Mass} = \text{UM} + \text{OM}_{\text{repr.}} + 100 \text{ kg} + 0,15 * (\text{LM} - \text{RM})$$

$$\text{Inertia} = \begin{cases} \text{TM} + 0.5 \cdot (0.03 \cdot \text{RM}) & [\text{Applicable for 4WD in following mode}] \\ \text{TM} & [\text{Applicable for 4WD}] \end{cases}$$

Where:

UM: unladen mass (kerb weight)

OM_{repr.}: mass of vehicle options (representative)

LM: laden mass (gross vehicle weight)

RM: is $\text{UM} + \text{OM} + 100 \text{ kg}$ (100 kg for driver and luggage)

TM: Test Mass

0,15: payload factor for M1 vehicles

3.3. Gear shifting instructions

3.3.1 Vehicles with a manual gearbox with a gear-shift indicator (GSI) are measured while shifting gears as recommended. According to VO (EU) 65/2012 and EG 661/2009 vehicles must be equipped with a GSI.

3.3.2 Vehicles with an automatic gearbox shift automatically. Depending on the driving mode in accordance to the test sequence, the proper driving mode for the gearbox is to apply.

3.3.3 Vehicles equipped with a manual gearbox which are equipped with a GSI that only gives up-shifting instructions shall be shifted down at 1300 rpm engine speed the latest.

3.4 Energy Consumers

3.4.1 Daytime running lights (or, alternatively, low beam) are on in all cycles.

3.4.2 All cabin temperatures must be at $23\text{ °C} \pm 3\text{ °C}$. Therefore, a temperature measuring tip has to be installed at the front-seat passenger's headrest. All measurements shall be recorded.

The air conditioning system is operated with the following settings:

3.4.2.1 The automatic air condition is operated with A/C switch on, temperature at 23 °C and fan speed on automatic regulation with airflow on automatic regulation. If necessary, the settings for temperature have to be readjusted. All readjustments have to be recorded and proved, e.g. by photographs.

3.4.2.2 The manual air condition is operated with A/C switch on, temperature $\frac{1}{2}$ (middle position) and fan speed on $\frac{1}{3}$ to $\frac{1}{4}$ with airflow on floor and windscreen. If necessary, the settings for temperature have to be readjusted. All readjustments have to be recorded and proved, e.g. by photographs.

3.4.3 No additional electric energy consumers shall be switched on.

3.4.4 The battery is fully charged before each cold start.

The Overall test procedure of Green NCAP Tests can be found in [GNT_Overall_Test_Procedure_v1.0.0.docx](#).

3.5 Test cell temperature

The test cell temperature shall be $14\text{ °C} \pm 3\text{ °C}$ while performing all the tests shown in the sequence below.

4. Laboratory Test Sequence

Overview Laboratory Test sequence		
Tasks	Annotations, underlying documents	Required documents for test documentation
Vehicle Data Collection	GNT_Parameter_Input_List_Template_v1.0.0.xlsx	Pictures, copies, filled chart
Vehicle Check	GNT_Overall_GNCAP_Test_Procedure_v1.0.0.docx , WP1	See chart for WP 1
Road Load Parameters	According to vehicle's COC documents. If COC documents are not available: according to GNT_Driving_Resistance_v1.0.0.docx	Fill in GNT_Parameter_Input_List_Template_v1.0.0.xlsx
Vehicle mounting on dyno	According to GNT_WLTC+_v1.0.0.docx , Sub-Annex 6	Pictures

Cooling Fan	According to <i>GNT_WLTC+_v1.0.0.docx, Sub-Annex 5</i>	Measurement report
Picture Documentation	According to: <i>GNT_Footage_procedure_v1.0.0</i>	
WLTC_warm	According to <i>GNT_WLTC+_v1.0.0.docx</i>	Measurement report, fill in <i>GNT_Template_Test_Results_v1.0.0.xlsx</i>
Coastdown on chassis dynamometer (dyno setting)	According to <i>GNT_WLTC+_v1.0.0.docx, Sub-Annex 6</i>	Measurement report, fill in <i>GNT_Template_Test_Results_v1.0.0.xlsx</i>
WLTC_precon	According to <i>GNT_WLTC+_v1.0.0.docx</i>	Measurement report, fill in <i>GNT_Template_Test_Results_v1.0.0.xlsx</i>
Soaktime, battery charging	Minimum 9h	
WLTC_cold_default_mode	According to <i>GNT_WLTC+_v1.0.0.docx</i>	Measurement report, fill in <i>GNT_Template_Test_Results_v1.0.0.xlsx</i>
BAB_default_mode	According to <i>GNT_WLTC+_v1.0.0.docx</i> and <i>GNT_BAB_Motorway_v1.0.0.docx</i>	Measurement report, fill in <i>GNT_Template_Test_Results_v1.0.0.xlsx</i>
WLTC_warm_eco_mode	According to <i>GNT_WLTC+_v1.0.0.docx</i>	Measurement report, fill in <i>GNT_Template_Test_Results_v1.0.0.xlsx</i>
WLTC_warm_sport_mode	According to <i>GNT_WLTC+_v1.0.0.docx</i>	Measurement report, fill in <i>GNT_Template_Test_Results_v1.0.0.xlsx</i>
Soaktime, battery charging	Minimum 9h	
Soaktime, battery charging	Minimum 9h	
WLTC_cold_default_mode_rep with PEMS correlation	According to <i>GNT_WLTC+_v1.0.0.docx</i>	Measurement report, pictures, fill in <i>GNT_Template_Test_Results_v1.0.0.xlsx</i>
Laboratory Test Analysis	<i>GNT_Test_performance_limits_v1.0.0.xlsx</i> and <i>GNT_Rating_scheme_description_v1.0.0</i>	<i>GNT_Rating_Sheet_Master_v1.0.0.xlsm</i>
Disassembly		