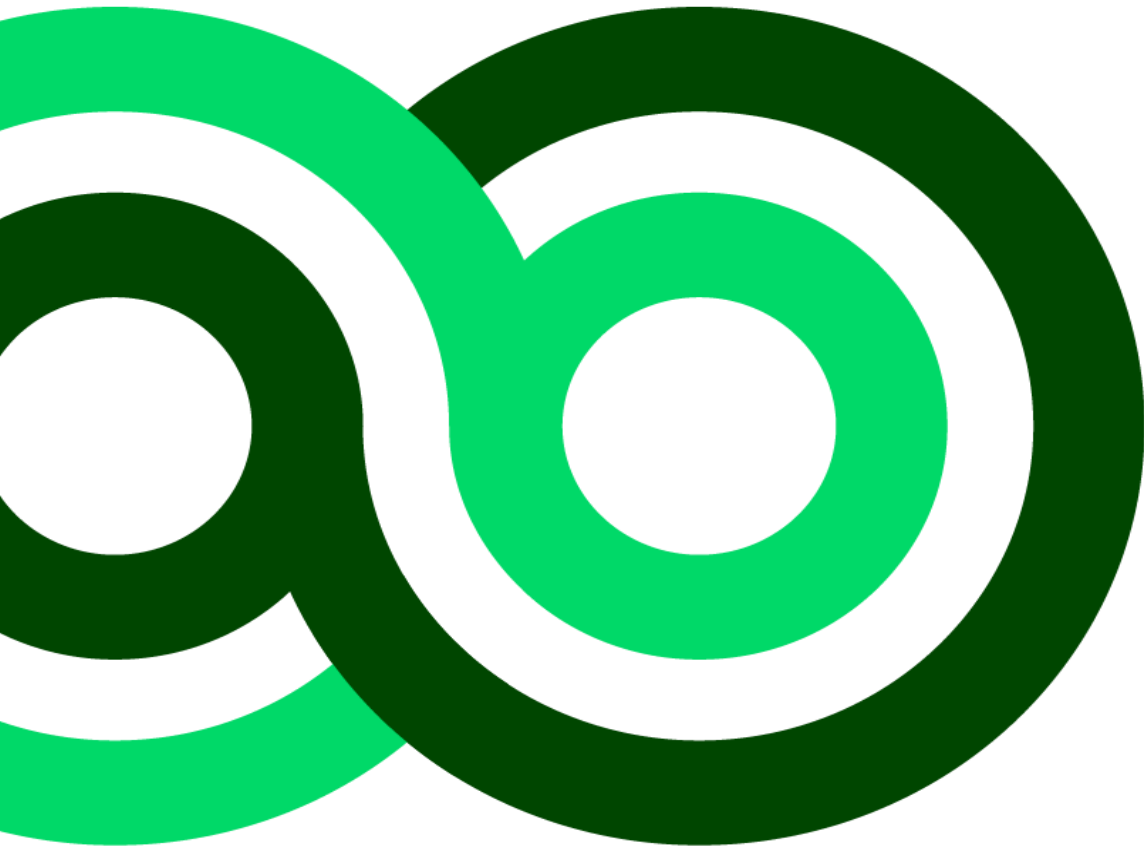


# Definitions, Accronyms & Symbols





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The test procedures related to the GreenNcap independent environmental performance test program refer to the definitions provided by UNECE Mutual Resolution No 2 <http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html> and in addition to the following definitions:



**Expression**

**means:**

**Source**

'2WD dynamometer'  
'4WD dynamometer'  
'access to information'  
'accuracy'

a dynamometer where only the wheels on one vehicle axle are in contact with the roller(s);  
a dynamometer where all wheels on both vehicle axles are in contact with the rollers;  
availability of all vehicle OBD and vehicle repair and maintenance information, required for the inspection, diagnosis, servicing or repair of the vehicle  
the difference between a measured value and a reference value, traceable to a national standard and describes the correctness of a result. See Figure 1;

Regulation (EU) 2017/1151, Annex XXI, point 3.2.31.  
Regulation (EU) 2017/1151, Annex XXI, point 3.2.31.  
Regulation (EU) 2017/1151, Art 2(23)  
Regulation (EU) 2017/1151, Annex XXI, 3.1.1

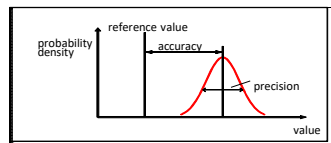


Figure 1: definition of accuracy, precision and reference value

'accuracy'  
'active heat storage device'

the deviation between a measured or calculated value and a traceable reference value;  
a technology that stores heat within any device of a vehicle and releases the heat to a powertrain component over a defined time period at engine start. It is characterised by the stored enthalpy in the system and the time for heat release to the powertrain components;

Regulation (EU) 2017/1151, Annex IIIA, 1.2.1.  
Regulation (EU) 2017/1151, Annex XXI, point 3.9.1.

'actual mass of the vehicle'  
'aerodynamic drag'  
'aerodynamic stagnation point'  
'all-electric range' (AER)

the mass in running order plus the mass of the fitted optional equipment to an individual vehicle;  
the force opposing a vehicle's forward motion through air;  
the point on the surface of a vehicle where wind velocity is equal to zero;  
the total distance travelled by an OVC-HEV from the beginning of the charge-depleting test to the point in time during the test when the combustion engine starts to consume fuel;

Regulation (EU) 2017/1151, Annex XXI, 3.2.24  
Regulation (EU) 2017/1151, Annex XXI, 3.2.1  
Regulation (EU) 2017/1151, Annex XXI, 3.2.2  
Regulation (EU) 2017/1151, Annex IIIA, 1.2.9. & Regulation (EU) 2017/1151, Annex XXI, 3.3.1.

'analyser'  
'anemometer blockage'

any measurement device that is not part of the vehicle but installed to determine the concentration or the amount of gaseous or particle pollutants;  
the effect on the anemometer measurement due to the presence of the vehicle where the apparent air speed is different than the vehicle speed combined with wind speed relative to the ground;

Regulation (EU) 2017/1051, Annex IIIA, 1.2.2.  
Regulation (EU) 2017/1151, Annex XXI, 3.2.3.

'auxiliary canister'  
'auxiliary devices'

the canister used to measure depressurisation puff loss overflow  
energy consuming, converting, storing or supplying non-peripheral devices or systems which are installed in the vehicle for purposes other than the propulsion of the vehicle and are therefore not considered to be part of the powertrain;

Regulation (EU) 2018/1832, Annex IV, point 3.3.14  
Regulation (EU) 2017/1151, Annex XXI, 3.4.2

'auxiliary emission strategy', (AES)

an emission strategy that becomes active and replaces or modifies a BES for a specific purpose and in response to a specific set of ambient or operating conditions and only remains operational as long as those conditions exist;

Regulation (EU) 2017/1151, Art 2(44)

'axis intercept' of a linear regression ( $a_0$ )

$$a_0 = \bar{y} - (a_1 \times \bar{x})$$

Regulation (EU) 2017/1051, Annex IIIA, 1.2.3.

where:

$a_1$  is the slope of the regression line  
 $\bar{x}$  is the mean value of the reference parameter  
 $\bar{y}$  is the mean value of the parameter to be verified

'base emission strategy', (BES)  
'bi fuel vehicle'  
'bi fuel vehicle'

an emission strategy that is active throughout the speed and load operating range of the vehicle unless an Auxiliary Emission Strategy is activated;  
vehicle with two separate fuel storage systems that is designed to run primarily on only one fuel at a time  
a vehicle with two separate fuel storage systems that is designed to run primarily on only one fuel at a time; however the simultaneous use of both fuels is permitted in limited amount and duration

Regulation (EU) 2017/1151, Art 2(43),  
Regulation (EU) 2018/1832, Art 1(1c 11)  
Regulation (EU) 2017/1151, Annex XXI, point 3.3.21

'bi fuel gas vehicle'  
'butane working capacity' (BWC)  
'BWC300'

bi-fuel vehicle where the two fuels are petrol (petrol mode) and either LPG, NG/biomethane, or hydrogen  
mass of butane which a canister can adsorb  
butane working capacity after 300 cycles of fuel ageing cycles experienced

Regulation (EU) 2018/1832, Art 1(1c 12)

'calibration'  
'calibration'  
'calibration gas'  
'category of propulsion energy converter'  
'category of propulsion energy storage system'

the process of setting the response of an analyser, flow-measuring instrument, sensor, or signal so that its output agrees with one or multiple reference signals;  
the process of setting a measurement system's response so that its output agrees with a range of reference signals;  
a gas mixture used to calibrate gas analysers;  
(i) an internal combustion engine, or (ii) an electric machine, or (iii) a fuel cell;  
(i) a fuel storage system, or (ii) a rechargeable electric energy storage system, or (iii) a rechargeable mechanical energy storage system;

Regulation (EU) 2018/1832, Annex IV, point 3.3.4  
Regulation (EU) 2017/1151, Annex IIIA, 1.2.4.  
Regulation (EU) 2017/1151, Annex XXI, point 3.1.2  
Regulation (EU) 2017/1151, Annex XXI, point 3.1.3  
Regulation (EU) 2017/1151, Annex XXI, point 3.3.9.2  
Regulation (EU) 2017/1151, Annex XXI, point 3.3.10.2.

'charge-depleting actual range' ( $R_{CDA}$ )  
'charge-depleting cycle range' ( $R_{CDD}$ )

the distance travelled in a series of WLTCs in charge-depleting operating condition until the Rechargeable Electric Energy Storage System (REESS) is depleted;  
the distance from the beginning of the charge-depleting test to the end of the last cycle prior to the cycle or cycles satisfying the break-off criterion, including the transition cycle where the vehicle may have operated in both depleting and sustaining conditions;

Regulation (EU) 2017/1151, Annex XXI, point 3.3.3  
Regulation (EU) 2017/1151, Annex XXI, point 3.3.4

'charge depleting operation' for OVC-HEV

an operating condition in which the energy stored in the Rechargeable Electric Energy Storage System (REESS) may fluctuate but decreases on average while the vehicle is driven until transition to charge-sustaining operation;

Regulation (EU) 2017/1151, Annex XXI, point 3.3.5 and Annex XXII, point 2.9

'charge depleting operation' for OVC-HEVs

the state of vehicle operation when the current REESS SOC is higher than the charge sustaining target SOC value and, while it may fluctuate, the intent of the vehicle control system is to deplete the SOC from a higher level down to the charge sustaining target SOC value

'charge-sustaining operating condition'  
'charge sustaining operation' for OVC-HEVs

an operating condition in which the energy stored in the REESS may fluctuate but, on average, is maintained at a neutral charging balance level while the vehicle is driven;  
the state of vehicle operation when the REESS state of charge (SOC) may fluctuate but the intent of the vehicle control system is to maintain, on average, the current state of charge;

Regulation (EU) 2017/1151, Annex XXI, point 3.3.6  
Regulation (EU) 2017/1151, Annex XXII, point 2.8

'coefficient of determination' ( $r^2$ )

$$r^2 = 1 - \frac{\sum_{i=1}^n (y_i - a_0 - (a_1 \times x_i))^2}{\sum_{i=1}^n (y_i - \bar{y})^2}$$

where:

$a_0$  is the axis intercept of the linear regression line  
 $a_1$  is the slope of the linear regression line  
 $x_i$  is the measured reference value  
 $y_i$  is the measured value of the parameter to be verified  
 $\bar{y}$  is the mean value of the parameter to be verified  
 $n$  is the number of values

Regulation (EU) 2017/1151, Annex IIIA, 1.2.5.

'cold start system or device'  
'constrained analysis'  
'criteria emissions'

a system which temporarily enriches the air/fuel mixture of the engine thus assisting the engine to start;  
the vehicle's frontal area and aerodynamic drag coefficient have been independently determined and those values shall be used in the equation of motion;  
those emission compounds for which limits are set in regional legislation;

Regulation (EU) 2017/1151, Art 2(30)  
Regulation (EU) 2017/1151, Annex XXI, point 3.2.4  
GTR No 15, ECE/TRANS/WP.29/2017/98, point 3.5.1.

| Expression   | means:  | Source   |
|--|---|--|
| 'cross-correlation coefficient' ( r )  | $r = \frac{\sum_{i=1}^n (x_i - \bar{x}) \times (y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \times \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}}$ <p>where:<br/> <math>\bar{x}</math> is the mean reference value<br/> <math>\bar{y}</math> is the mean value of the parameter to be verified<br/> <math>n</math> is the number of values<br/> <math>\bar{x}</math> is the number of values<br/> <math>\bar{y}</math> is the mean value of the parameter to be verified<br/> <math>n</math> is the number of values</p>  | Regulation (EU) 2017/1151, Annex IIIA, 1.2.6.  |
| 'cycle energy demand'<br>'defeat device'   | the calculated positive energy required by the vehicle to drive the prescribed cycle;<br>any element of design which senses temperature, vehicle speed, engine speed (RPM), transmission gear, manifold vacuum or any other parameter for the purpose of activating, modulating, delaying or deactivating the operation of any part of the emission control system, that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use;  | Regulation (EU) 2017/1151, Annex XXI, point 3.5.6<br>Regulation (EC) No 715/2007, Art 3(10)  |
| 'deficiency'   | in the context of the OBD system, that up to two separate components or systems which are monitored contain temporary or permanent operating characteristics that impair the otherwise efficient OBD monitoring of those components or systems or do not meet all of the other detailed requirements for OBD  | Regulation (EU) 2017/1151, Art 2(24)   |
| 'delay time'   | the difference in time between the change of the component to be measured at the reference point and a system response of 10 per cent of the final reading (t10) with the sampling probe being defined as the reference point. For gaseous components, this is the transport time of the measured component from the sampling probe to the detector.<br>means the time from the gas flow switching (t0) until the response reaches 10 per cent (t10) of the final reading   | Regulation (EU) 2017/1151, Art 2(20)   |
| 'delay time'<br>'delay time'   | the time from the gas flow switching (t0) until the response reaches 10 per cent (t10) of the final reading;<br>the difference in time between the change of the component to be measured at the reference point and a system response of 10 per cent of the final reading (t10) with the sampling probe being defined as the reference point. For gaseous components, this is the transport time of the measured component from the sampling probe to the detector;  | Regulation (EU) 2017/1151, Annex IIIA, 1.2.7<br>Regulation (EU) 2018/1832, Annex IX, point 3.1.17  |
| 'depressurisation puff loss'<br>'depressurisation puff loss overflow'<br>'deteriorated replacement pollution control device'   | hydrocarbons venting from a sealed fuel tank system pressure relief exclusively through the vapour storage unit allowed by the system;<br>the depressurisation puff loss hydrocarbons that pass through the vapour storage unit during depressurisation;<br>a pollution control device as defined in Article 3(11) of Regulation (EC) No 715/2007 that has been aged or artificially deteriorated to such an extent that it fulfils the requirements laid out in Section 1 to Appendix 1 to Annex XI of UN/ECE Regulation No 83;  | Regulation (EU) 2018/1832, Annex IV, point 3.3.11<br>Regulation (EU) 2018/1832, Annex IV, point 3.3.12<br>Regulation (EU) 2017/1151, Art 2(25)   |
| 'double dilution method'<br>'driving-cycle'<br>'driver-selectable charge increasing operation' for OVC-HEV<br>'driver-selectable mode'<br>'drivetrain'<br>'dynamometer in 2WD operation'   | the process of separating a part of the diluted exhaust flow and mixing it with an appropriate amount of dilution air prior to the particulate sampling filter;<br>in respect of vehicle OBD systems, engine start-up, driving mode where a malfunction would be detected if present, and engine shut-off;<br>the operating condition in which the driver has selected a mode of operation, with the intention to increase the REESS SOC<br><br>a distinct driver-selectable condition which could affect emissions, or fuel and/or energy consumption;<br>the connected elements of the powertrain for transmission of the mechanical energy between the propulsion energy converter(s) and the wheels;<br>a 2WD dynamometer, or a 4WD dynamometer which only simulates inertia and road load on the powered axle of the test vehicle while the wheels on the non-powered axle do not influence the measurement result, independent of whether they are rotating or not;   | Regulation (EU) 2017/1151, Annex XXI, point 3.1.4<br>Regulation (EU) 2017/1151, Art 2(22)<br>Regulation (EU) 2017/1151, ANNEX XXII, point 2.10   |
| 'dynamometer in 4WD operation'<br>'electric machine' (EM)<br>'electric powertrain'   | a 4WD dynamometer which simulates inertia and road load on both axes of the test vehicle;<br>an energy converter transforming between electrical and mechanical energy;<br>a system consisting of one or more electric energy storage devices, one or more electric power conditioning devices and one or more electric machines that convert stored electric energy to mechanical energy delivered at the wheels for propulsion of the vehicle;  | Regulation (EU) 2017/1151, ANNEX XXI, point 3.2.35<br>Regulation (EU) 2017/1151, ANNEX XXI, point 3.3.8<br>Regulation (EU) 2017/1151, Art 2(33)  |
| 'emission control system'  | the electronic engine management controller and any emission-related component in the exhaust or evaporative system which supplies an input to or receives an output from this controller;  | Regulation (EU) 2017/1151, Art 2(18)   |
| 'emissions' also referred to as 'components',<br>'pollutant components' or 'pollutant emissions'<br>'energy converter'<br>'energy storage system'<br>'engine capacity'   | the Green NCAP tested gaseous or particle constituents of the exhaust;<br><br>a system where the form of energy output is different from the form of energy input;<br>a system which stores energy and releases it in the same form as was input;<br>either of the following:<br>(a) for reciprocating piston engines, the nominal engine swept volume;<br>(b) for rotary piston (Wankel) engines, double the nominal engine swept volume;  | Regulation (EU) 2017/1151, Annex IIIA, 1.2.10., adapted for GNCAP  |
| 'engine control unit (ECU) signals or data'<br>'engine control unit'<br>'engine fuel rate'<br>'engine misfire'<br>'evaporative emissions'<br>'equivalent all-electric range' (EAER)<br>'exhaust emissions'<br>'exhaust emissions'<br>'exhaust', also referred to as 'exhaust gas'<br>'flex fuel biodiesel vehicle'<br>'flex fuel ethanol vehicle'<br>'flex fuel vehicle'<br>'form of energy'<br>'fuel cell hybrid vehicle' (FCHV)<br>'fuel cell vehicle' (FCV)<br>'fuel cell'<br>'fuel storage system'<br>'fuel storage system'<br>'fuel system' | any vehicle information and signal recorded from the vehicle network using the protocols specified in point 3.4.5 of Appendix 1 to Annex IIIA to Regulation (EU) 2017/1151 ;<br>the electronic unit that controls various actuators to ensure the optimal performance of the powertrain;<br>the amount of fuel injected into the engine per unit of time. It does not include fuel injected directly into the pollution control device<br>lack of combustion in the cylinder of a positive ignition engine due to absence of spark, poor fuel metering, poor compression or any other cause<br>the hydrocarbon vapours lost from the fuel system of a motor vehicle during parking and immediately before refuelling of a sealed fuel tank<br>means that portion of the total charge-depleting actual range (R CDA ) attributable to the use of electricity from the REESS over the charge-depleting range test<br>emissions of particles, characterized as particulate matter and particle number, and of gaseous components at the tailpipe of a vehicle<br>emission of gaseous, solid and liquid compounds from the tailpipe;<br>the total of all gaseous and particulate components emitted at the exhaust outlet or tailpipe as the result of fuel combustion within the vehicle's internal combustion engine;<br><br>a flex fuel vehicle that can run on mineral diesel or a mixture of mineral diesel and biodiesel;<br>a flex fuel vehicle that can run on petrol or a mixture of petrol and ethanol up to an 85 per cent ethanol blend (E85);<br>a vehicle with one fuel storage system that can run on different mixtures of two or more fuels;<br>(i) electrical energy, or (ii) mechanical energy, or (iii) chemical energy (including fuels);<br>a vehicle equipped with a powertrain containing exclusively fuel cell(s) and electric machine(s) as propulsion energy converter(s);<br>a vehicle equipped with a powertrain containing exclusively fuel cell(s) and electric machine(s) as propulsion energy converter(s);<br>an energy converter transforming chemical energy (input) into electrical energy (output) or vice versa;<br>a propulsion energy storage system that stores chemical energy as liquid or gaseous fuel;<br>devices which allow storing the fuel, comprising of the fuel tank, the fuel filler, the filler cap and the fuel pump;<br>the components which store or transport fuel on board the vehicle and comprise the fuel tank system, all fuel and vapour lines, any non-tank mounted fuel pumps and the activated carbon canister; | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.8.<br>Regulation (EU) 2017/1151, Annex IIIA, point 1.2.9.<br>Regulation (EU) 2017/1151, ANNEX XXII, point 2.3<br>Regulation (EU) 2017/1151, Art 2(29)<br>Regulation (EU) 2017/1151, Annex IV, point 3.3.9.<br>Regulation (EU) 2017/1151, Annex XXI, point 3.3.11<br>Regulation (EU) 2017/1151, Annex IIIA, point 1.2.12<br>Regulation (EU) 2017/1151, Annex XXI, point 3.5.11.<br>Regulation (EU) 2017/1151, Annex IIIA, 1.2.11.<br>Regulation (EU) 2017/1151, Art 2(15)<br>Regulation (EU) 2017/1151, Art 2(14)<br>Regulation (EU) 2017/1151, Art 2(13)<br>Regulation (EU) 2017/1151, ANNEX XXI, point 3.3.10.3<br>Regulation (EU) 2017/1151, ANNEX XXI, point 3.3.20<br>Regulation (EU) 2017/1151, Art 2(36)<br>Regulation (EU) 2017/1151, ANNEX XXI, point 3.3.19<br>Regulation (EU) 2017/1151, ANNEX XXI, point 3.3.10.4<br>Regulation (EU) 2017/1151, Art 2(45),<br>Regulation (EU) 2018/1832, Annex IV, point 3.3.2 |
| 'fuel tank system'<br>'fuel tank relief pressure'<br>'full flow exhaust dilution system'<br>'full scale'   | the devices which allow storing the fuel, comprising the fuel tank, the fuel filler, the filler cap and the fuel pump when it is fitted in or on the fuel tank;<br>the minimum pressure value at which the sealed fuel tank system starts venting in response only to pressure inside the tank.<br>the continuous dilution of the total vehicle exhaust with ambient air in a controlled manner using a Constant Volume Sampler (CVS);<br>the full range of an analyser, flow-measuring instrument or sensor as specified by the equipment manufacturer; if a sub-range of the analyser, flow-measuring instrument or sensor is used for measurements, full scale shall be understood as the maximum reading;   | Regulation (EU) 2018/1832, Art1f<br>Regulation (EU) 2018/1832, Annex IV, point 3.3.13<br>Regulation 2017/1151, Annex XXI point 3.1.5.<br>Regulation (EU) 2017/1151, Annex IIIA, point 1.2.13.  |
| 'Grid energy' means, for OVC-HEVs,   | the electric energy flowing into the battery when the vehicle is connected to an external power supply and the engine is turned off. It shall not include electrical losses between the external power source and the battery;  | Regulation (EU) 2017/1151, ANNEX XXII, point 2.7   |
| 'hybrid electric vehicle' (HEV)<br>'hybrid vehicle' (HV)   | a hybrid vehicle where one of the propulsion energy converters is an electric machine;<br>a vehicle equipped with a powertrain containing at least two different categories of propulsion energy converters and at least two different categories of propulsion energy storage systems;   | Regulation (EU) 2017/1151, ANNEX XXI, point 3.3.12<br>Regulation (EU) 2017/1151, ANNEX XXI, point 3.3.13   |

| Expression   | means:   | Source   |
|--|--|--|
| 'hydrocarbon response factor' of a particular hydrocarbon species              | the ratio between the reading of a FID and the concentration of the hydrocarbon species under consideration in the reference gas cylinder, expressed as ppmC <sub>1</sub> ;  | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.14.                                     |
| 'insulation materials'   | any material in the engine compartment attached to the engine and/or the chassis with a thermal insulation effect and characterised by a maximum heat conductivity of 0.1 W/(mK);  | Regulation (EU) 2017/1151, Annex XXI, 3.9.2.   |
| 'laboratory test'  | vehicle chassis dynamometer testing under controlled ambient conditions in a laboratory environment  | Green NCAP definition  |
| 'lifetime' OBFCM value of a certain quantity determined and stored at a time t | the values of this OBFCM fuel quantity accumulated since the completion of production of the vehicle until time t.   | Regulation (EU) 2018/1151, Annex XXII, point 2.2   |
| 'linearisation'  | the application of a range of concentrations or materials to establish a mathematical relationship between concentration and system response;  | Regulation (EU) 2018/1151, Annex XXI, point 3.1.6.                                       |
| 'major maintenance'  | the adjustment, repair or replacement of a component or module that could affect the accuracy of a measurement   | Regulation (EU) 2017/1151, Annex XXI, point 3.1.7.                                       |
| 'malfunction indicator' (MI)   | a visible or audible indicator that clearly informs the driver of the vehicle in the event of a malfunction of any emission-related component connected to the OBD system, or of the OBD system itself;  | Regulation (EU) 2017/1151, Art 2(19)   |
| 'malfunction'  | the failure of an emission-related component or system that would result in emissions exceeding the limits in section 2.3 of Annex XI or if the OBD system is unable to fulfil the basic monitoring requirements set out in Annex XI to Regulation (EU) 2017/1151;   | Regulation (EU) 2017/1151, Art 2(20)   |
| 'manual transmission'  | a transmission where gears can only be shifted by action of the driver;  | Regulation (EU) 2017/1151, Annex XXI, point 3.4.5.                                       |
| 'mass in running order'  | the mass of the vehicle, with its fuel tank(s) filled to at least 90 per cent of its or their capacity/capacities, including the mass of the driver, fuel and liquids, fitted with the standard equipment in accordance with the manufacturer's specifications and, when they are fitted, the mass of the bodywork, the cabin, the coupling and the spare wheel(s) as well as the tools;     | Regulation (EU) 2017/1151, Annex XXI, point 3.2.5  |
| 'mass of the driver'   | a mass rated at 75 kg located at the driver's seating reference point;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.6  |
| 'mass of the optional equipment'   | maximum mass of the combinations of optional equipment which may be fitted to the vehicle in addition to the standard equipment in accordance with the manufacturer's specifications;  | Regulation (EU) 2017/1151, Annex XXI, point 3.2.8  |
| 'mass representative of the vehicle load'                                      | x per cent of the maximum vehicle load where x is 15 per cent for category M vehicles and 28 per cent for category N vehicles;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.26.                                      |
| 'maximum 30 minutes power'   | the maximum net power of an electric drive train at DC voltage as set out in paragraph 5.3.2. of UN/ECE Regulation No 85 (OJ L 323, 7.11.2014, p52 );  | Regulation (EU) 2017/1151, Art 2(39)   |
| 'maximum vehicle load'   | the technically permissible maximum laden mass minus the mass in running order, 25 kg and the mass of the optional equipment as defined in 'mass of the optional equipment';   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.7  |
| 'maximum vehicle speed'  | the maximum speed of a vehicle as declared by the manufacturer   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.2.                                       |
| 'mono fuel gas vehicle'  | a mono fuel vehicle that primarily runs on LPG, NG/biomethane, or hydrogen but may also have a petrol system for emergency purposes or starting only, where the petrol tank does not contain more than 15 litres of petrol;  | Regulation (EU) 2017/1151, Art 2(10) & Regulation (EU) 2018/1832, Annex IV point 3.3.10. |
| 'mono fuel vehicle'  | a vehicle that is designed to run primarily on one type of fuel;   | Regulation (EU) 2017/1151, Art 2(9)  |
| 'monolayer tank'   | a fuel tank constructed with a single layer of material  | Regulation (EU) 2017/1151, Art 2(47)   |
| 'monolayer non-metal tank'   | a fuel tank constructed with a single layer of non-metal material including fluorinated/sulfonated materials   | Regulation (EU) 2018/1832 Art 1f (47)  |
| 'multilayer tank'  | a fuel tank constructed with at least two different layered materials, one of which is a hydrocarbon barrier material  | Regulation (EU) 2018/1832 Art 1f (48)  |
| 'net energy change'  | the ratio of the REESS energy change divided by the cycle energy demand of the test vehicle;   | Regulation (EU) 2017/1151, Annex XXI, point 3.3.14                                       |
| 'net power'  | the power obtained on a test bench at the end of the crankshaft or its equivalent at the corresponding engine or motor speed with the auxiliaries, tested in accordance with Annex XX (Measurements of net power and the maximum 30 minutes power of electric drive train), and determined under reference atmospheric conditions;   | Regulation (EU) 2017/1151, Art 2(37)   |
| 'noise'  | two times the root mean square of ten standard deviations, each calculated from the zero responses measured at a constant frequency which is a multiple of 1,0 Hz during a period of 30 seconds;   | Regulation (EU) 2018/1832, Annex IIIA, point 1.2.16.                                     |
| 'non-methane hydrocarbons' (NMHC)  | the total hydrocarbons (THC) excluding methane (CH <sub>4</sub> );   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.17.                                     |
| 'not off-vehicle charging hybrid electric vehicle' (NOVC-HEV)                  | a hybrid electric vehicle that cannot be charged from an external source;  | Regulation (EU) 2017/1151, Annex XXI, point 3.3.15                                       |
| 'n/v ratio'  | the engine rotational speed divided by vehicle speed in a specific gear;   | Regulation (EU) 2017/1151, Annex IX, point 3.2.28  |
| 'odometer'   | that part of the odometer equipment which indicates to the driver the total distance recorded by the vehicle since its entry into service;   | Regulation (EU) 2017/1151, Art 2(3)  |
| 'off-vehicle charging hybrid electric vehicle' (OVC-HEV)                       | a hybrid electric vehicle that can be charged from an external source;   | Regulation (EU) 2017/1151, Annex XXI, point 3.3.16.                                      |
| 'on-board Fuel and/or Energy Consumption Monitoring Device' ('OBFCM device')   | any element of design, either software and/or hardware, which senses and uses vehicle, engine, fuel and/or electric energy parameters to determine and make available at least the information laid down in point 3, and store the lifetime values on board the vehicle;   | Regulation (EU) 2017/1151, Annex XXII, point 2.1.  |
| 'optional equipment'   | all the features not included in the standard equipment which are fitted to a vehicle under the responsibility of the manufacturer, and that can be ordered by the customer;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.9.                                       |
| 'original replacement pollution control device'                                | a pollution control device or an assembly of pollution control devices whose types are indicated in Appendix 4 to Annex I to Regulation (EU) 2017/1151 but are offered on the market as separate technical units by the holder of the vehicle type-approval;   | Regulation (EU) 2017/1151, Art 2(7)  |
| 'particle number' (PN)   | the total number of solid particles emitted from the vehicle exhaust   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.18.amended for Green NCAP purposes      |
| 'particle number emissions' (PNE)  | the total number of solid particles emitted from the vehicle exhaust quantified according to the dilution, sampling and measurement methods as specified in the Green NCAP test procedures;  | Regulation (EU) 2017/1151, Annex XXI, point 3.6.1, amended for Green NCAP purposes       |
| 'permeability factor' (PF)   | the hydrocarbon emissions as reflected in the permeability of the fuel storage system;   | Regulation (EU) 2017/1151, Art 2(46)   |
| 'particulate matter emissions' (PME)   | the mass of any particulate material from the vehicle exhaust quantified according to the dilution, sampling and measurement methods as specified in the Green NCAP test procedures;   | Regulation (EU) 2017/1151, Annex XXI, point 3.6.2.                                       |
| 'periodically regenerating system'   | an exhaust emissions control device (e.g. catalytic converter, particulate trap) that requires a periodical regeneration process;  | Regulation (EU) 2018/1832, Art 1(1b)   |
| 'peripheral devices'   | energy consuming, converting, storing or supplying devices, where the energy is not primarily used for the purpose of vehicle propulsion, or other parts, systems and control units, which are essential to the operation of the powertrain;   | Regulation (EU) 2017/1151, Annex XXI, 3.4.3  |
| 'permeability factor' 'PEMS+' test   | the factor determined on the basis of hydrocarbon losses over a period of time and used to determine the final evaporative emissions; Green NCAP test procedure conducted with a portable emissions measurement system under real-world conditions   | Regulation (EU) 2018/1832, Art 1(1b)<br>Green NCAP definition                            |
| 'power take-off operation or unit'   | an engine-driven output provision for the purposes of powering auxiliary, vehicle mounted, equipment;  | Regulation (EU) 2017/1151, Art 2(31)   |
| 'powered axle'   | an axle of a vehicle which is able to deliver propulsion energy and/or recuperate energy, independent of whether that is only temporarily or permanently possible and/or selectable by the driver;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.31                                       |
| 'powertrain'   | the total combination in a vehicle of propulsion energy storage system(s), propulsion energy converter(s) and the drivetrain(s) providing the mechanical energy at the wheels for the purpose of vehicle propulsion, plus peripheral devices;  | Regulation (EU) 2017/1151, Annex XXI, point 3.4.1  |
| 'precision'  | the degree to which repeated measurements under unchanged conditions show the same results (Figure 1) and, in the test procedures, always refers to one standard deviation;  | Regulation (EU) 2017/1151, Annex XXI, point 3.1.9  |
| 'predominant mode'   | single driver-selectable mode that is always selected when the vehicle is switched on, regardless of the driver-selectable mode in operation when the vehicle was previously shut down, and which cannot be redefined to another mode. After the vehicle is switched on, the predominant mode can only be switched to another driver-selectable mode by an intentional action of the driver; | Regulation (EU) 2017/1151, Annex XXI, point 3.5.9.                                       |
| 'properly maintained and used'   | for the purpose of a test vehicle, that such a vehicle satisfies the criteria for acceptance of a selected vehicle laid down in section 2 of Appendix 3 to UN/ECE Regulation No 83 (OJ L 172, 3.7.2015, p.1);  | Regulation (EU) 2017/1151, Art 2(17)   |
| 'propulsion energy converter'  | an energy converter of the powertrain which is not a peripheral device whose output energy is used directly or indirectly for the purpose of vehicle propulsion;   | Regulation (EU) 2017/1151, Annex XXI, point 3.3.9.1.                                     |
| 'propulsion energy storage system'   | an energy storage system of the powertrain which is not a peripheral device and whose output energy is used directly or indirectly for the purpose of vehicle propulsion;  | Regulation (EU) 2017/1151, Annex XXI, point 3.3.10.1.                                    |
| 'pure electric range' (PER)  | the total distance travelled by a PEV from the beginning of the charge-depleting test until the break-off criterion is reached;  | Regulation (EU) 2017/1151, Annex XXI, point 3.3.2.                                       |
| 'pure electric vehicle' (PEV)  | a vehicle equipped with a powertrain containing exclusively electric machines as propulsion energy converters and exclusively rechargeable electric energy storage systems as propulsion energy storage systems;   | Regulation (EU) 2017/1151, Annex XXI, point 3.3.2.                                       |
| 'pure ICE vehicle'   | a vehicle where all of the propulsion energy converters are internal combustion engines;   | Regulation (EU) 2018/1832, Art 1.1.d   |

| Expression  | means:   | Source   |
|---|--|--|
| 'rated engine power' ( $P_{rated}$ )                                  | the maximum net power of the engine or motor in kW measured in accordance with the requirements of Annex XX to Regulation (EU) 2017/1151   | Regulation (EU) 2018/1832, Art 1e                      |
| 'reading'   | the numerical value displayed by an analyser, flow-measuring instrument, sensor or any other measurement device applied in the context of vehicle emission measurements;   | Regulation (EU) 2017/1151, Annex IIIA, point 3.1.2.20. |
| 'reagent'   | any product other than fuel that is stored on-board the vehicle and is provided to the exhaust after-treatment system upon request of the emission control system;   | Regulation (EU) 2017/1151, Art 2(27)                   |
| 'real driving emissions (RDE)'  | the emissions of a vehicle under its 'normal' conditions of use, set out in approval legislation;  | Regulation (EU) 2017/1151, Art 2(41),                  |
| 'reference atmospheric conditions (regarding road load measurements)' | the atmospheric conditions to which these measurement results are corrected:<br>(a) atmospheric pressure: $p_0 = 100$ kPa;<br>(b) atmospheric temperature: $T_0 = 20$ °C;<br>(c) dry air density: $\rho_0 = 1.189$ kg/m <sup>3</sup> ;<br>(d) wind speed: 0 m/s;   | Regulation (EU) 2017/1151, Annex XXI, point 3.1.2.10.  |
| 'reference conditions (with regards to calculating mass emissions)'   | the conditions upon which gas densities are based, namely 101.325 kPa and 273.15 K (0 °C);   | Regulation (EU) 2017/1151, Annex XXI, point 3.5.10.    |
| 'reference speed'   | the vehicle speed at which road load is determined or chassis dynamometer load is verified;  | Regulation (EU) 2017/1151, Annex XXI, 3.2.11.          |
| 'reference value'   | a value traceable to a national standard; See Figure 1;  | Regulation (EU) 2017/1151, Annex XXI, point 3.1.1.10   |
| 'response time'   | the difference in time between the change of the component to be measured at the reference point and a system response of 90 per cent of the final reading (t90) with the sampling probe being defined as the reference point, whereby the change of the measured component is at least 60 per cent full scale (FS) and takes place in less than 0.1 second. The system response time consists of the delay time to the system and of the rise time of the system. | Regulation (EU) 2017/1151, Annex IIIA, 3.1.16          |
| 'response time' (t <sub>90</sub> )                                    | the sum of the delay time and the rise time;   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.21.   |
| 'rise time' (t <sub>10</sub> )  | the time between the 10 per cent and 90 per cent response (t <sub>90</sub> - t <sub>10</sub> ) of the final reading;   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.22.   |
| 'road load'   | the force resisting the forward motion of a vehicle as measured with the coastdown method or methods that are equivalent regarding the inclusion of frictional losses of the drivetrain;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.12     |
| 'rolling resistance'  | the forces of the tyres opposing the motion of a vehicle;  | Regulation (EU) 2017/1151, Annex XXI, point 3.2.13     |
| 'root mean square' (x <sub>rms</sub> )                                | (x rms) means the square root of the arithmetic mean of the squares of values and defined as:<br>$x_{rms} = \sqrt{\frac{1}{n}(x_1^2 + x_2^2 + \dots + x_n^2)}$<br>where:<br>x is the measured or calculated value<br>n is the number of values   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.23.   |
| 'running resistance'  | the torque resisting the forward motion of a vehicle measured by torque meters installed at the driven wheels of a vehicle;  | Regulation (EU) 2017/1151, Annex XXI, point 3.2.14.    |
| 'sealed fuel tank system'   | a fuel tank system where the fuel vapours do not vent during parking over the 24-hour diurnal cycle defined in Appendix 2 to Annex 7 of UN/ECE Regulation No 83 when performed with a reference fuel defined in Section A.1 of Annex IX to Regulation 2017/1151;   | Regulation (EU) 2017/1151, Annex IV, point 3.3.8       |
| 'secondary air'   | the air introduced into the exhaust system by means of a pump or aspirator valve or other means that is intended to aid in the oxidation of HC and CO contained in the exhaust gas stream;   | Regulation (EU) 2017/1151, Art 2(21)                   |
| 'sensor'  | any measurement device that is not part of the vehicle itself but installed to determine parameters other than the concentration of gaseous and particle pollutants and the exhaust mass flow;   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.24.   |
| 'set point'   | the target value a control system aims to reach;   | Regulation (EU) 2017/1151, Annex XXI, point 3.1.11     |
| 'simulated road load'   | the road load experienced by the vehicle on the chassis dynamometer which is intended to reproduce the road load measured on the road, and consists of the force applied by the chassis dynamometer and the forces resisting the vehicle while driving on the chassis dynamometer and is approximated by the three coefficients of a second order polynomial;  | Regulation (EU) 2017/1151, Annex XXI, point 3.2.15     |
| 'simulated running resistance'  | the running resistance experienced by the vehicle on the chassis dynamometer which is intended to reproduce the running resistance measured on the road, and consists of the torque applied by the chassis dynamometer and the torque resisting the vehicle while driving on the chassis dynamometer and is approximated by the three coefficients of a second order polynomial;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.16     |
| 'single roller dynamometer'   | a dynamometer where each wheel on a vehicle's axle is in contact with one roller;  | Regulation (EU) 2017/1151, Annex IIIA, 3.2.29.         |
| 'slope' of a linear regression (a1)                                   | $a_1 = \frac{\sum_{i=1}^n (y_i - \bar{y}) \times (x_i - \bar{x})}{\sum_{i=1}^n (x_i - \bar{x})^2}$<br>where:<br>$\bar{x}$ is the mean value of the reference parameter<br>$\bar{y}$ is the mean value of the parameter to be verified<br>$x_i$ is the actual value of the reference parameter<br>$y_i$ is the actual value of the parameter to be verified<br>n is the number of values  | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.28.   |
| 'span'  | to adjust an instrument so that it gives a proper response to a calibration standard that represents between 75 per cent and 100 per cent of the maximum value in the instrument range or expected range of use;   | Regulation (EU) 2017/1151, Annex XXI, point 3.1.12     |
| 'span response'   | the mean response to a span signal over a time interval of at least 30 seconds;  | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.26.   |
| 'span response drift'   | the difference between the mean response to a span signal and the actual span signal that is measured at a defined time period after an analyser, flow-measuring instrument or sensor was accurately spanned;  | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.27.   |
| 'standard equipment'  | the basic configuration of a vehicle which is equipped with all the features that are required under the regulatory acts referred to in Annex IV and Annex XI of Directive 2007/46/EC including all features that are fitted without giving rise to any further specifications on configuration or equipment level;  | Regulation (EU) 2017/1151, Annex XXI, point 3.1.18     |
| 'standard error of estimate' (SEE)                                    | $SEE = \frac{1}{x_{max}} \times \sqrt{\frac{\sum_{i=1}^n (y_i - \hat{y})^2}{(n-2)}}$<br>where:<br>$\hat{y}$ is the estimated value of the parameter to be verified<br>$y_i$ is the actual value of the parameter to be verified<br>$x_{max}$ is the maximum actual value of the reference parameter<br>n is the number of values   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.29.   |
| 'starting aid'  | glow plugs, modifications to the injection timing and other devices which assist the engine to start without enrichment of the air/fuel mixture of the engine;   | Regulation (EU) 2018/1151, Art 2(4)                    |
| 'stationary anemometry'   | measurement of wind speed and direction with an anemometer at a location and height above road level alongside the test road where the most representative wind conditions will be experienced;  | Regulation (EU) 2017/1151, Annex XXI, point 3.2.17.    |
| 'target road load'  | the road load to be reproduced;  | Regulation (EU) 2017/1151, Annex XXI, point 3.1.19.    |
| 'target running resistance'   | the running resistance to be reproduced on the chassis dynamometer;  | Regulation (EU) 2017/1151, Annex XXI, point 3.2.20.    |
| 'technically permissible laden mass'                                  | the maximum mass allocated to a vehicle on the basis of its construction features and its design performances;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.25.    |
| 'technically permissible maximum laden mass of the combination' (MC)  | the maximum mass allocated to the combination of a motor vehicle and one or more trailers on the basis of its construction features and its design performances or the maximum mass allocated to the combination of a tractor unit and a semi-trailer;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.27.    |

| Expression  | means:  | Source   |
|---|---|--|
| 'test mass of the vehicle'                              | sum of the actual mass of the vehicle, 25 kg and the mass representative of the vehicle load;   | Regulation (EU) 2017/1151, Annex XXI, point 3.2.23.  |
| 'total distance travelled (lifetime)'                   | the accumulation of the distance travelled using the same data source that the vehicle odometer uses  | Regulation (EU) 2017/1151, Annex XXII, point 2.6     |
| 'total fuel consumed (lifetime)'                        | the accumulation of the calculated amount of fuel injected into the engine and the calculated amount of fuel injected directly into the pollution control device. It does not include the fuel used by a fuel operated heater;  | Regulation (EU) 2017/1151, Annex XXII, point 2.5     |
| 'total hydrocarbons' (THC)                              | the sum of all volatile compounds measurable by a flame ionization detector (FID);  | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.30. |
| 'traceable'   | the ability to relate a measurement or reading through an unbroken chain of comparisons to a known and commonly agreed standard;  | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.31. |
| 'transformation time'                                   | the time difference between a change of concentration or flow ( $t_0$ ) at the reference point and a system response of 50 per cent of the final reading ( $t_{50}$ );  | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.32. |
| 'twin roller dynamometer'                               | dynamometer where each wheel on a vehicle's axle is in contact with two rollers;  | Regulation (EU) 2017/1151, Annex IIIA, point 3.2.30. |
| 'type of analyser', also referred to as 'analyser type' | a group of analysers produced by the same manufacturer that apply an identical principle to determine the concentration of one specific gaseous component or the number of particles;   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.33. |
| 'type of exhaust mass flow meter'                       | a group of exhaust mass flow meters produced by the same manufacturer that share a similar tube inner diameter and function on an identical principle to determine the mass flow rate of the exhaust gas;   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.34. |
| 'type of pollution control device'                      | catalytic converters and particulate filters which do not differ in any of the following essential aspects:<br>(a) number of substrates, structure and material;<br>(b) type of activity of each substrate;<br>(c) volume, ratio of frontal area and substrate length;<br>(d) catalyst material content;<br>(e) catalyst material ratio;<br>(f) cell density;<br>(g) dimensions and shape;<br>(h) thermal protection; | Regulation (EU) 2017/1151, Art 2(8)                  |
| 'utility factors'                                       | ratios based on driving statistics depending on the range achieved in charge-depleting condition and are used to weigh the charge-depleting and charge-sustaining exhaust emission compounds, CO2 emissions and fuel consumption for OVC-HEVs;  | Regulation (EU) 2017/1151, Annex XXI, point 3.3.7    |
| 'vehicle coastdown mode'                                | a system of operation enabling an accurate and repeatable determination of road load and an accurate dynamometer setting;   | Regulation (EU) 2017/1151, Annex IIIA, 3.2.21.       |
| 'vehicle fuel rate'                                     | the amount of fuel injected into the engine and directly into the pollution control device per unit of time. It does not include the fuel used by a fuel operated heater  | Regulation (EU) 2017/1151, Annex XXII, point 2.4     |
| 'vehicle OBD information'                               | information relating to an on-board diagnostic system for any electronic system on the vehicle;   | Regulation (EU) 2017/1151, Art 2(26)                 |
| 'wind correction'                                       | correction of the effect of wind on road load based on input of the stationary or on-board anemometry;  | Regulation (EU) 2017/1151, Annex XXI, point 3.2.21.  |
| 'WLTC' test   | Green NCAP emission laboratory test based on regulatory WLTP test   | Green NCAP definition                                |
| 'WLTP' test   | Regulatory emission laboratory test procedure in accordance with UN GTR No 15 and Annex XXI of Regulation (EU) No 2017/1151   | Green NCAP definition                                |
| 'zero'  | the calibration of an analyser, flow-measuring instrument or sensor so that it gives an accurate response to a zero signal;   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.37. |
| 'zero gas'  | a gas containing no analyte, which is used to set a zero response on an analyser;   | Regulation (EU) 2017/1151, Annex XXI, point 3.1.15   |
| 'zero response'   | the mean response to a zero signal over a time interval of at least 30 seconds;   | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.38. |
| 'zero response drift'                                   | the difference between the mean response to a zero signal and the actual zero signal that is measured over a defined time period after an analyser, flow-measuring instrument or sensor has been accurately zero calibrated;  | Regulation (EU) 2017/1151, Annex IIIA, point 1.2.39. |



| Expression | means:  |
|------------|---|
| 2/3/4/5G   | generations of mobile telecommunications technology   |
| 3GPP       | 3rd Generation Partnership Project  |
| ABD        | Automatic brake force distribution  |
| ABS        | Anti-lock Braking System  |
| AC         | Alternating current   |
| ACC        | Adaptive Cruise Control   |
| ACFS       | Automated Commanded Steering Function   |
| ACSF       | Automatically commanded steering function (as part of UN Reg.79 on Steering Equipment)  |
| ADS        | Automated Driving System  |
| AER        | All-electric range  |
| AES        | Advanced Encryption Standard  |
| AES        | Auxiliary Emission Strategy   |
| AES-CMAC   | Advanced Encryption Standard Cipher-based Message Authentication Code   |
| AFV        | Alternative Fuel Vehicle: Battery electric vehicle (BEV), Plug-in Hybrid Electric Vehicle (PHEV), Fuel Cell Vehicle (FCV), Gaseous Fuel Vehicle (LPG, CNG, LNG, Hydrogen) |
| APF        | Assigned Permeability Factor  |
| APN        | Access Point Name   |
| ASEP       | Additional Sound Emission Provisions  |
| ASM        | Additional Safety Margin  |
| ASSP       | After-sales Service Provider  |
| ASTM       | American Society for Testing and Materials  |
| AT         | Automatic Transmission  |
| ATC        | Additives Technical Committee <a href="http://www.atc-europe.org">www.atc-europe.org</a>  |
| ATCT       | Ambient Temperature Correction Test   |
| ATS        | After-Treatment System exhaust gasses   |
| B2B        | Business to Business  |
| B2B        | Back to Back testing  |
| BAD        | Bench Ageing Duration   |
| BC         | Black Carbon  |
| bCall      | Breakdown call  |
| BES        | Base Emission Strategy  |
| BEV        | Battery Electric Vehicle, also referred to as EV's or Electric Vehicle  |
| BWC        | Butane Working Capacity   |
| CAC        | Channel Amplitude Class   |
| CAN        | Controller Area Network   |



| <b>Expression</b> | <b>means:</b>   |
|-------------------|---|
| CARS 21           | Competitive Automotive Regulatory System for the 21st century |
| CAV               | Connected and Autonomous vehicle                              |
| CBC               | Cipher Block Chaining   |
| CBC-MAC           | Cipher Block Chaining Message Authentication Code             |
| CCAM              | Connected and Automated Mobility                              |
| CCS               | Carbon capture and storage                                    |
| CCU               | Communication Control Unit                                    |
| CD                | Charge-depleting (operating condition)                        |
| CEL annex         | Complex Electronic Annex                                      |
| CFC               | Channel Frequency Class                                       |
| CFO               | Cyclic Field Operations                                       |
| CFO               | Critical Flow Orifice   |
| CFV               | Critical flow venturi   |
| CHO               | Cyclic Harvest Operations                                     |
| CIE               | Compression-Ignition Engine                                   |
| C-ITS             | Cooperative Intelligent Transport Systems                     |
| CLA               | Chemi-Luminescent Analyser                                    |
| CLD               | Chemiluminescent detector                                     |
| CLWP              | Commission Legislative and Work Programme                     |
| CNG               | Compressed Natural Gas  |
| CO <sub>2e</sub>  | Carbon Dioxide equivalent                                     |
| CoC               | Certificate of Conformity                                     |
| ConVeX            | Connected Vehicle to Everything of Tomorrow consortium        |
| COP               | Conformity of Production                                      |
| Coreper           | Permanent Representatives Committee, Council                  |
| CR                | Common Rail   |
| CRG               | Compressed Renewable Gas                                      |
| CS                | Charge-sustaining (operating condition)                       |
| CT                | Complete Test   |
| CTR               | Counter (mode)  |
| C-V2X             | cellular vehicle to everything (usually implying V2V and V2I) |
| CVS               | Constant Volume Sampling                                      |
| CVS               | Constant Volume Sampler                                       |
| CVT               | Continuously Variable Transmission                            |
| CVT               | Continuous Variable Transmission                              |

| Expression        | means:  |
|-------------------|---|
| DAF               | Dilution Air Filter                               |
| DC                | Direct Current                                    |
| DCT               | Dual Clutch Transmission                          |
| DD                | Dynamic Driving                                   |
| deNO <sub>x</sub> | NO <sub>x</sub> after-treatment system            |
| DESS              | Digitally Encoded Security System                 |
| DF                | Deterioration Factor                              |
| DIF               | Dilution Factor                                   |
| DOHC              | Double Over-Head Camshaft                         |
| DOP               | Di-octylphtalate                                  |
| DP                | Dual Purpose (tyre)                               |
| DPF               | Diesel Particulate Filter                         |
| DPS               | Dynamic Power Steering                            |
| DR                | Density Ratio                                     |
| DRBG              | Deterministic Random Bit Generator                |
| DRL               | Daytime Running Lights                            |
| DSRC              | Dedicated Short Range Communication               |
| DSSA              | Data Storage System for Automated Driving         |
| DT                | Dilution Tunnel                                   |
| DTC               | Diagnostic Trouble Code                           |
| DVLA              | Driver and Vehicle Licensing Agency               |
| DVSA              | Driver and Vehicle Standards Agency               |
| EAER              | Equivalent All-Electric Range                     |
| EBS               | Electronic Control Transmission                   |
| eCall             | emergency call                                    |
| ECL               | Electric Control Line                             |
| ECU               | Electronic Control Unit                           |
| EDR               | Event Data Recorder                               |
| EEA               | European Economic Area                            |
| EAER              | Equivalent all-electric range                     |
| EEPROM            | Electrical Erasable Programmable Read-Only Memory |
| EFV               | Environmentally Friendly Vehicles                 |
| EGR               | Exhaust Gas Recirculation                         |
| EGR HP            | Exhaust Gas Recirculation - High Pressure         |
| EGR LP            | Exhaust Gas Recirculation - Low Pressure          |

| Expression             | means:   |
|------------------------|--|
| ELV                    | End-of-Life Vehicles   |
| EMC                    | Electromagnetic compatibility  |
| EoS                    | End-of-Series (vehicle)  |
| EPD                    | Emission Provoking Driving   |
| ESC                    | Electronic Stability Control   |
| ESP                    | Electronic Stability Program, also referred to as ESC or EVSC  |
| ET                     | Evaporation tube   |
| EUDC                   | Extra-Urban Driving Cycle  |
| Euro 3, Euro 4, Euro 5 | European Emission standards  |
| EURO NCAP              | European New Car Assessment Programme <a href="http://www.euroncap.com">www.euroncap.com</a>                             |
| EV                     | Electric Vehicle   |
| EVSC                   | Electronic Vehicle Stability Control   |
| Extra High3            | WLTC extra high speed phase for Class 3 vehicles   |
| ExVe                   | Extended Vehicle (vehicle data access concept ACEA)  |
| EXW                    | Ex works   |
| F2F                    | Face to Face   |
| FAC                    | Femur Acceptability Criterion  |
| FCF                    | Family Correction Factor   |
| FCHV                   | Fuel cell hybrid vehicle   |
| FCV                    | Fuel Cell Vehicle using hydrogen gas to power an electric motor vehicle  |
| FFC                    | Femur Force Criterion  |
| FID                    | Flame Ionization Detector  |
| FMEA                   | Failure Mode and Effect Analysis   |
| FSD                    | Full scale deflection  |
| FTA                    | Fault Tree Analysis  |
| G(V)SR                 | General (Vehicle) Safety Regulation  |
| GC                     | Gas Chromatograph  |
| GC                     | Gas chromatograph  |
| GCM                    | Galois/Counter Mode  |
| GDI                    | Gasoline Direct Injection (Engine)   |
| GPF                    | Gasoline Particulate Filter  |
| GR                     | Group of Rapporteurs (WP.29)   |
| GRBP                   | Groupe de travail sur le bruit et pneu/ Working Party on Noise and tyres (UNECE WP.29)                                   |
| GRE                    | Groupe de travail sur l'éclairage et la signalisation lumineuse / Working Party on Lighting and Light-Signalling (WP.29) |
| GRPE                   | Groupe de travail sur la pollution et l'énergie  |

| Expression            | means:  |
|-----------------------|---|
| GRSG                  | Groupe de travail des dispositions générales de sécurité  |
| GRSP                  | Groupe de travail sur la sécurité passive / Working Party on Passive Safety (WP.29)                 |
| GRVA                  | Groupe de travail véhicules automatisés / Working Party on automated and connected vehicles (WP.29) |
| GSM                   | Global System for Mobile communication  |
| GTAA                  | Granting Type-Approval Authority  |
| GVM                   | Gross Vehicle Mass  |
| GVW                   | Gross Vehicle Weight  |
| HAPV                  | Human and Animal Powered Vehicles.  |
| HAV                   | Highly Autonomous Vehicle   |
| HC                    | Hydrocarbons  |
| HCB                   | HexaCloroBenzene  |
| HCLD                  | Heated Chemiluminescent Detector  |
| HDV                   | Heavy Duty Vehicles, such as buses and cargo trucks (semis or lorries).                             |
| HE                    | Heat Exchanger  |
| HEC                   | Hybrid Engine Cycle   |
| HEPA                  | High Efficiency Particulate Air   |
| HEV                   | Hybrid Electric Vehicles  |
| HFID                  | Heated flame ionisation detector  |
| HILS                  | Hardware-in-the-loop simulation   |
| HMI                   | Human Machine Interface   |
| HPC                   | Hybrid Powertrain Cycle   |
| HSM                   | Hardware Security Module  |
| HV                    | Hybrid Vehicles   |
| HVB                   | High Voltage Battery  |
| ICE                   | Internal Combustion Engine  |
| ICE                   | Internal Combustion Engine  |
| ID                    | Identification Number   |
| IEC                   | International Electrotechnical Commission   |
| IF                    | Improved Inflexion tyre marking   |
| IMP                   | Implement tyre marking  |
| IND or Industrial     | Tyres for use in construction applications  |
| IP                    | Intellectual Property   |
| IP (short for TCP/IP) | Transmission Control Protocol/Internet Protocol   |
| ISC                   | In-Service Conformity   |
| ISO                   | International Organization for Standardization  |

| Expression        | means:   |
|-------------------|--|
| ITC               | Inland Transport Committee (UNECE)   |
| ITS - G5          | European standard for vehicular communication on IEEE 802.11p                              |
| IUPR <sub>M</sub> | In Use Performance Ratio Monitoring  |
| IWG               | Informal Working Group at UNECE  |
| IWVTA             | International Whole Vehicle Type Approval  |
| LC                | Liquid chromatography  |
| LDV               | Light-duty vehicle, refers to passenger cars and light commercial vehicles (delivery vans) |
| LED               | Light Emitting Diode   |
| LED               | Low Emission Driving   |
| LI                | Load Capacity Index  |
| Lidar             | Laser, detection and ranging   |
| LIV               | Load Intensity Value   |
| LNT               | Lean NOx Trap  |
| LoD               | Limit of detection   |
| LoQ               | Limit of quantification  |
| Low3              | WLTC low speed phase for Class 3 vehicles  |
| LPG               | Liquefied Petroleum Gas  |
| LT                | Rim diameter marking and Tyre to rim fitment configuration                                 |
| LTE               | Long-Term Evolution  |
| MaS               | Market Surveillance  |
| M.V.E.G.          | Motor Vehicle Emissions Group  |
| M.V.W.G.          | Motor Vehicles Working Group   |
| MaaS              | Mobility-as-a-Service  |
| MC                | Mixing Chamber   |
| Medium3-1         | WLTC medium speed phase for Class 3 vehicles with v <sub>max</sub> < 120 km/h              |
| Medium3-2         | WLTC medium speed phase for Class 3 vehicles with v <sub>max</sub> ≥ 120 km/h              |
| MFDD              | Mean Fully Developed Deceleration  |
| MI                | Malfunction Indicator  |
| MI                | Malfunction indicator  |
| MIR               | Maximum Increment Reactivity   |
| ML                | Mining and Logging   |
| MOT               | Ministry of Transport  |
| MPI               | Multi-Point Injection (Engine)   |
| MRO               | Mass in Running Order  |
| MSAT              | Mobile Source Air Toxics   |

| Expression    | means:   |
|---------------|--|
| MST           | Multiservice Tyres   |
| MT            | Manual Transmission  |
| MVC           | Modular Vehicle Combination  |
| NA            | Naturally Aspirated (Engine)   |
| NAT           | Network Address Translation  |
| NDC           | National Development Contribution                                    |
| NDIR          | Non-Dispersive Infrared (Analyzer)                                   |
| NDUV          | Non-dispersive ultraviolet   |
| NDUVR         | Non-Dispersive Ultra-Violet Resonance Absorption                     |
| NEC           | Net energy change  |
| NECD          | National Emission Ceilings Directive                                 |
| NEDC          | New European Driving Cycle   |
| NG            | Natural Gas  |
| NG/biomethane | Natural gas/biomethane   |
| NHS           | Not for Highway Service  |
| NIC           | National Infrastructure Commission                                   |
| NMC           | Non-Methane Cutter   |
| NMHC          | Non-methane hydrocarbons   |
| NMU           | Non-Motorised Users  |
| NOVC          | Not Off Vehicle Charging   |
| NOVC-FCHV     | Not Off-Vehicle Charged (Fuel Cell Hybrid Vehicle)                   |
| NOVC-HEV      | Not Off-Vehicle Charged (Hybrid Electric Vehicle)                    |
| OBD           | On-Board Diagnostic  |
| OBD II        | (USA) On-Board Diagnostics, stage II                                 |
| OBFCM         | On-board Fuel and/or Energy Consumption Monitoring (software) device |
| OBM           | On-Board Monitoring  |
| ODD           | Operational Design Domain  |
| OE            | Original Equipment   |
| OEDR          | Object and Event Detection and Response                              |
| OEM           | Original Equipment Manufacturer                                      |
| OEM           | Original Equipment Manufacturer                                      |
| OFP           | Ozone Formation Potential  |
| OHC           | Over-Head Camshaft   |
| OHV           | Over-Head Valves (camshaft into Crankcase)                           |
| OLA           | UNECE Office for Legal Affairs                                       |

| <b>Expression</b> | <b>means:</b>   |
|-------------------|---|
| OTA               | Over-The-Air  |
| OPC               | Open Public Consultation  |
| OTL               | On-Board Diagnostic (emission pass/fail) Threshold / Limit  |
| OTP               | Open Telematics Platform  |
| OVC               | Off Vehicle Charging  |
| OVC-FCHV          | Off-Vehicle Charged Fuel Cell Hybrid Vehicle  |
| OVC-HEV           | Off-Vehicle Charged Hybrid Electric Vehicle   |
| PAH               | PolyAromatic Hydrocarbons   |
| PAO               | Poly-alpha-olefin   |
| PAVE              | People in Autonomous Vehicles in Urban Environments consortium  |
| PbD               | Privacy by Design   |
| PCB               | Polychlorinated Biphenyls   |
| PCF               | Particle pre-classifier   |
| PCRF              | Particle concentration reduction factor   |
| PCU               | Powertrain Control Unit   |
| PDP               | Positive Displacement Pump  |
| PEMS              | Portable Emission Measurement System  |
| PEMS+             | Portable Emission Measurement System test for the purposes of Green NCAP  |
| PEN               | Penetration Value of Bitumen  |
| PER               | Pure electric range   |
| Per cent FS       | Per cent of Full Scale  |
| PEV               | Pure electric vehicle   |
| PF                | Permeability Factor   |
| PFS               | Partial Flow System   |
| PHEV              | Plug-in Hybrid Electric Vehicle   |
| PID               | Parameter Identifiers   |
| PIE               | Positive Ignition Engine  |
| PM                | Particulate Matter  |
| PM/PN             | PM is Particulate Matter, PN is Particulate Number. The term 'particle' is conventionally used for the matter being characterised (measured) in the airborne phase (suspended matter), and the term 'particulate' for the deposited matter. |
| PMR               | Power-Mass-Ratio  |
| PN                | Particulate Number  |
| PNC               | Particle Number Counter   |
| PND1              | First particle number dilution device   |
| PND2              | Second particle number dilution device  |

| Expression | means:  |
|------------|---|
| POP        | Persistent Organic Pollutants                                   |
| POR        | Professional Off Road Tyre                                      |
| PRAC       | Commission procedure: Procédure de Réglementation Avec Contrôle |
| PRESS      | Pneumatic RESS  |
| PSI        | Pound per Square Inch   |
| PSP        | Particle Sampling Point   |
| PSPF       | Pubic Symphysis Peak Force                                      |
| PSV        | Polished Stone Value  |
| PTFE       | Polytetrafluoretheen  |
| PTI        | Periodical Technical Inspection                                 |
| PTS        | Particle Transfer System  |
| PTT        | Particle transfer tube  |
| PtX        | Power to X  |
| PU         | Polyurethane  |
| PVC        | Polyvinylchloride   |
| PZM        | Polish Automobile and Motorcycle Association                    |
| QCL-IR     | Infrared quantum cascade laser                                  |
| QRTV       | Quiet Road Transport Vehicles                                   |
| R&D        | Research and development  |
| Radar      | Radio, detection and ranging                                    |
| RCB        | REESS Charge Balance  |
| RCD        | Remote Control Drive  |
| RCP        | Remote Control Parking  |
| RDC        | Rib Deflection Criterion  |
| RDE        | Real Drive Emission   |
| RDS        | Remote Diagnosis Support  |
| REESS      | Rechargeable Electric Energy Storage System                     |
| REINF      | Reinforced tyre   |
| RESS       | Replacement Exhaust Silencing Systems                           |
| Rev        | Revision  |
| RFWS       | Run-Flat Warning System   |
| RHESS      | Hydraulic RESS  |
| RISM       | Road Infrastructure and Safety Management                       |
| RMESS      | Mechanical RESS   |
| RPM        | Round per minute  |



| Expression | means:   |
|------------|--|
| RRC        | Rolling Resistance Coefficient                           |
| RSB        | Regulatory Scrutiny Board                                |
| RSP        | Respirable suspended particles                           |
| SAE        | Society of Automotive Engineers                          |
| SBC        | Standard Bench Cycle                                     |
| SC         | Supercharger   |
| SCR        | Selective Catalyst Reaction                              |
| SCRoF      | SCR on filter  |
| SDBC       | Standard Diesel Bench Cycle                              |
| SFAD       | Static Force Application Device                          |
| SIA        | Secondary Inorganic Aerosol                              |
| SIM        | Subscriber Identity Module                               |
| SLD        | Speed Limitation Device                                  |
| SM         | Square Mesh sieve size                                   |
| SNG        | Synthetic Natural Gas                                    |
| SOA        | Secondary Organic Aerosol                                |
| SORDE      | Special Operation RDE                                    |
| SPCCI      | SPark Controlled Compression Ignition                    |
| SPI        | Stateful Package Inspection                              |
| SRC        | Standard Road Cycle                                      |
| SSF        | Static Stability Factor                                  |
| SSV        | Subsonic Venturi   |
| SVOC       | Semi-Volatile Organic Compound                           |
| TA         | Type-approval  |
| TA         | Type Approval  |
| TAA        | Type-approval Authority                                  |
| TAAEG      | Type-approval Authorities Expert group (EC expert group) |
| TAAM       | Type-Approval Authorities Meetings (without EC)          |
| TaaS       | transport-as-a-service                                   |
| TAR        | Type-Approval Regulation                                 |
| TC         | Turbocharger   |
| TCFC       | Tibia compression Force Criterion                        |
| TCMV       | Technical Committee Motor Vehicles                       |
| TCP/IP     | Transmission Control Protocol/Internet Protocol          |
| TCS        | Traction Control System                                  |

| <b>Expression</b> | <b>means:</b>   |
|-------------------|---|
| TCU               | Telematics Control Unit   |
| TD                | Texture Depth   |
| TE                | Total Energy  |
| THC               | Total Hydrocarbons  |
| THC               | Total hydrocarbons  |
| ThCC              | Thorax Compression Criterion  |
| TJA               | Traffic Jam Assistant   |
| TPIS              | Third Party In-Service  |
| TPMS              | Tyre Pressure Monitoring System   |
| TPN               | Total Particle Number (including volatile fractions)  |
| TPS               | Throttle position sensor  |
| TPS eCall         | Third Party Service eCall   |
| TRNG              | True Random Number Generator  |
| TS                | Technical Service   |
| TT                | Tourist Trophy  |
| TT                | Transfer Tube   |
| T-Type            | Temporary Use Spare Tyre designed for higher use inflation than normal  |
| UBRL              | Upper Bumper Reference Line   |
| UDC               | Urban Driving Cycle   |
| UMTS              | Universal Mobile Telecommunications Service   |
| UNECE             | United Nations Economic Committee for Europe - World Forum for Harmonization of Vehicle Regulations (WP.29)<br><a href="http://www.unece.org/trans/main/welcwp29.htm">www.unece.org/trans/main/welcwp29.htm</a> |
| USFM              | Ultrasonic flow meter   |
| V*C               | Viscous Criterion   |
| V2C               | Vehicle to cloud  |
| V2I               | Vehicle to infrastructure   |
| V2V               | Vehicle to vehicle  |
| V2X               | Vehicle to everything   |
| VC                | Void Content  |
| VDC               | Vehicle Dynamic Control   |
| VGT               | Variable Geometry Turbine   |
| VIN               | Vehicle Identification Number   |
| VMT               | Vehicle Miles Travelled   |
| VOC               | Volatile Organic Compound   |
| VPR               | Volatile Particle Remover   |

| Expression | means:   |
|------------|--|
| VPR        | Volatile particle remover  |
| VRU        | Emergency Relay Valve  |
| VRU        | Vulnerable Road Users  |
| VSF        | Vehicle Stability Function   |
| VSS        | Vehicle Stability System, Vehicle Speed Sensor   |
| WAD        | Wrap Around Distance   |
| WAN        | Wide Area Network  |
| WAVE       | Wireless Access in Vehicular Environments (IEEE 802.11p)                                   |
| WFAG       | World Forum Advisory Group   |
| WHDC       | Worldwide Heavy Duty Certification Procedure   |
| WHSC       | World Harmonized Steady State Cycle  |
| WHTC       | World Harmonized Transient Cycle   |
| WHVC       | World Harmonized Vehicle Cycle   |
| WLTC       | Worldwide light-duty vehicle test cycle  |
| WLTC+      | Worldwide light-duty vehicle test cycle customtailored for Green NCAP purposes             |
| WLTP       | Worldwide-Harmonized Light-Vehicles Test Procedures  |
| WOT        | Wide Open Throttle   |
| WP.29      | UNECE Working Party 29, Forum for world-harmonised vehicle approval legislation            |
| WSC        | Web Service Client   |
| WVTA       | Whole Vehicle Type Approval  |
| YC         | Yaw Control  |
| ZEV        | Zero Emissions Vehicle includes Fuel Cell Vehicle (FCV) and Battery Electric Vehicle (BEV) |

| Expression  | means:   | Source  |
|---|--|---|
| $(v \cdot a)_i$   | actual vehicle speed per acceleration in time step i [ $m^2/s^3$ or W/kg]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| $(v \cdot a_{pos})_{j,k}$   | actual vehicle speed per positive acceleration greater than 0.1 $m/s^2$ in time step j considering the urban, rural and motorway shares [ $m^2/s^3$ or W/kg].            | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| $(v \cdot a_{pos})_{k-}[95]$  | 95 <sup>th</sup> percentile of the product of vehicle speed per positive acceleration greater than 0.1 $m/s^2$ for urban, rural and motorway shares [ $m^2/s^3$ or W/kg] | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| #   | number   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| #   | number   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| #/km  | number per kilometre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| #/m <sup>3</sup>  | number per cubic metre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| #/s   | number per second  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| %   | per cent   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| %   | per cent   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| %   | per cent   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| %   | per cent   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| %   | per cent   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| %   | per cent   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| <   | smaller than   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| <   | smaller  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| >   | larger than  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| >   | larger   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| ≤   | smaller or equal   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| ≤   | smaller than or equal to   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| ≤   | smaller or equal   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| ≤   | smaller or equal   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| ≥   | larger than or equal to  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| ≥   | larger or equal  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| ≥   | larger or equal  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| °C  | degrees centigrade   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| A   | undiluted CO <sub>2</sub> concentration [%]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| a   | acceleration [ $m/s^2$ ]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| A/F <sub>st</sub>   | stoichiometric air-to-fuel ratio [kg/kg]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| a <sub>0</sub>  | y-axis intercept of the linear regression line   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| a <sub>0</sub>  | y intercept of the regression line   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| a <sub>1</sub>  | slope of the linear regression line  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| a <sub>1</sub>  | slope of the regression line   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| a <sub>1</sub>  | coefficient of the CO <sub>2</sub> characteristic curve  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| a <sub>1</sub> , b <sub>1</sub>   | coefficients of the CO <sub>2</sub> characteristic curve   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| a <sub>2</sub>  | coefficient of the CO <sub>2</sub> characteristic curve  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| a <sub>2</sub> , b <sub>2</sub>   | coefficients of the CO <sub>2</sub> characteristic curve   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| ACEA recommends to use a fixed frequency of 1 Hz in order to minimize interference with the provisions of the other Appendices (particularly Appendix 6) and to facilitate post-processing of the data. |  |   |
| a <sub>ref</sub>  | Reference acceleration for P <sub>drive</sub>  | Commission Regulation (EU) 2017/xxx correcting act, point 2a, Version 10 Nov 16           |
| aref  | Reference acceleration for Pdrive , [0.45 $m/s^2$ ]  |   |
| B   | diluted CO <sub>2</sub> concentration [%]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |

| Expression        | means:  | Source  |
|-------------------|---|---|
| $b_1$             | coefficient of the CO <sub>2</sub> characteristic curve   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| $b_2$             | coefficient of the CO <sub>2</sub> characteristic curve   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| $c$               | analyser response in the oxygen interference test   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C$               | diluted NO concentration [ppm]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_1$             | Carbon 1 equivalent hydrocarbon   | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| $C_2H_5OH$        | Ethanol   | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| $C_2H_6$          | Ethane  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| $C_3H_8$          | Propane   | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| $C_{CH4}$         | concentration of methane  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{CO}$          | dry CO concentration [%]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{CO2}$         | dry CO <sub>2</sub> concentration [%]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{dry}$         | dry concentration of a pollutant in ppm or per cent volume  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{FS,b}$        | full scale HC concentration in step (b) [ppmC <sub>1</sub> ]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_{FS,d}$        | full scale HC concentration in step (d) [ppmC <sub>1</sub> ]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_{gas,i}$       | instantaneous concentration of the exhaust component "gas" [ppm]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $CH_4$            | Methane   | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| $C_{HC(w/NMC)}$   | HC concentration with CH <sub>4</sub> or C <sub>2</sub> H <sub>6</sub> flowing through the NMC [ppmC <sub>1</sub> ] | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{HC(w/NMC)}$   | HC concentration with CH <sub>4</sub> or C <sub>2</sub> H <sub>6</sub> flowing through the NMC [ppmC <sub>1</sub> ] | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_{HC(w/o NMC)}$ | HC concentration with CH <sub>4</sub> or C <sub>2</sub> H <sub>6</sub> bypassing the NMC [ppmC <sub>1</sub> ]       | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_{HC(w/oNMC)}$  | HC concentration with CH <sub>4</sub> or C <sub>2</sub> H <sub>6</sub> bypassing the NMC [ppmC <sub>1</sub> ]       | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{HCw}$         | wet HC concentration [ppm]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{i,c}$         | time-corrected concentration of component $i$ [ppm]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{i,r}$         | concentration of component $i$ [ppm] in the exhaust   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $C_{m,b}$         | measured HC concentration in step (b) [ppmC <sub>1</sub> ]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_{m,d}$         | measured HC concentration in step (d) [ppmC <sub>1</sub> ]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_{NMHC}$        | concentration of non-methane hydrocarbons   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| CO                | Carbon monoxide   | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| CO <sub>2</sub>   | Carbon dioxide  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| $C_{ref,b}$       | reference HC concentration in step (b) [ppmC <sub>1</sub> ]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_{ref,d}$       | reference HC concentration in step (d) [ppmC <sub>1</sub> ]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $C_{wet}$         | wet concentration of a pollutant in ppm or per cent volume  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $d$               | cumulative distance travelled at the discrete way point under consideration [m]                                     | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $D$               | undiluted NO concentration [ppm]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $d(0)$            | distance at the start of a trip [m]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $d_0$             | cumulative distance travelled until the measurement directly before the respective way point $d$ [m]                | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $d_1$             | cumulative distance travelled until the measurement directly after the respective way point $d$ [m]                 | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $d_a$             | reference way point at $d(0)$ [m]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $d_e$             | cumulative distance travelled until the last discrete way point [m]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $D_e$             | expected diluted NO concentration [ppm]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |

| Expression      | means:   | Source  |
|-----------------|--|---|
| $d_i$           | instantaneous distance [m]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $d_j$           | distance covered by window $j$ [km]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17                        |
| DOP             | Di-octylphthalate  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                                      |
| $d_{tot}$       | total test distance [m]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| DWLTC           | intercept of the Veline from WLTC  |   |
| $E$             | absolute operating pressure [kPa]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $E_{(dp)}$      | PEMS-PN analyser efficiency  | Commission Regulation (EU) 2017/xxx, draft amendments Annex IIIA (RDE3), appendix 2, point 2, Version 10 Nov 16 |
| $E_{CO_2}$      | per cent CO <sub>2</sub> quench  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $E_E$           | ethane efficiency  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $E_E$           | ethane efficiency  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17                         |
| $E_{H_2O}$      | per cent water quench  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $E_M$           | methane efficiency   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $E_M$           | methane efficiency   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17                         |
| $E_{O_2}$       | oxygen interference  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $F$             | water temperature [K]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $f_0, f_1, f_2$ | Driving resistance coefficients [N], [N/(km/h)], [N/(km/h) <sup>2</sup> ]  |   |
| $g$             | gramme   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17                         |
| $G$             | saturation vapour pressure [kPa]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $g$             | gram   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $g$             | gramme   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17                         |
| $g/km$          | gramme per kilometre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17                         |
| $g/s$           | gramme per second  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17                         |
| $g/s$           | gramme per second  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17                         |
| $g_{H_2O/kg}$   | gramme water per kilogram  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $h$             | hour   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17                         |
| $h$             | hour   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $h$             | distance of windows to the CO <sub>2</sub> characteristic curve [%]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17                        |
| $H$             | water vapour concentration [%]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17                         |
| $h(0)$          | vehicle altitude after the screening and principle verification of data quality at the start of a trip [m above sea level] | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $h(d)$          | vehicle altitude at the way point $d$ [m above sea level]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $h(t)$          | vehicle altitude after the screening and principle verification of data quality at point $t$ [m above sea level]           | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $h(t-1)$        | vehicle altitude after the screening and principle verification of data quality at point $t-1$ [m above sea level]         | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $H_2O$          | Water  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                                      |
| $H_a$           | intake air humidity [g water per kg dry air]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17                         |
| $h_{corr}(0)$   | corrected altitude directly before the respective way point $d$ [m above sea level]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $h_{corr}(1)$   | corrected altitude directly after the respective way point $d$ [m above sea level]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $h_{corr}(t)$   | corrected instantaneous vehicle altitude at data point $t$ [m above sea level]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $h_{corr}(t-1)$ | corrected instantaneous vehicle altitude at data point $t-1$ [m above sea level]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |
| $h_{GPS}(t)$    | vehicle altitude measured with GPS at data point $t$ [m above sea level]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17                       |

| Expression        | means:  | Source  |
|-------------------|---|---|
| $h_{GPS,i}$       | instantaneous vehicle altitude measured with GPS [m above sea level]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $h_{int}(d)$      | interpolated altitude at the discrete way point under consideration $d$ [m above sea level]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $h_{int,sm,1}(d)$ | smoothed and interpolated altitude, after the first smoothing run at the discrete way point under consideration $d$ [m above sea level] | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $H_m$             | maximum water vapour concentration [%]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $h_{map}(t)$      | vehicle altitude based on topographic map at data point $t$ [m above sea level]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| Hz                | hertz   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| Hz                | hertz   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| Hz                | hertz   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| Hz                | hertz   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $i$               | number of the measurement   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $i$               | Time step for instantaneous measurements, minimum resolution 1Hz  |   |
| Index (i)         | discrete time step  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| Index (j)         | discrete time step of positive acceleration datasets  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| Index (k)         | refers to the respective category (t=total, u=urban, r=rural, m=motorway)   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| $j$ .....         | Wheel power class, $j=1$ to 9   |   |
| K                 | kelvin  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| K                 | kelvin  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $k$               | Time step for the 3 second moving average values  |   |
| $k_{11}$          | coefficient of the weighing function  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| $k_{11}, k_{12}$  | coefficients of the weighing function   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| $k_{12}$          | coefficient of the weighing function  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| $k_{21}$          | coefficient of the weighing function  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| $k_{21}, k_{21}$  | coefficients of the weighing function   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| $k_{22}$          | coefficient of the weighing function  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| kg                | kilogramme  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| kg                | kilogramme  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| kg                | kilogramme  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| kg/h              | kilogramme per hour   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| kg/s              | kilogramme per second   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| kg/s              | kilogramme per second   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| km                | kilometre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| km                | kilometre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| km/h              | kilometre per hour  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| km/h              | kilometre per hour  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| km/h              | kilometer per hour  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| kPa               | kilopascal  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| kPa               | kilopascal  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| kPa/min           | kilopascal per minute   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| $k_w$             | dry-wet correction factor   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| kWLTC             | Slope of the Veline from WLTC   |   |
| l                 | litre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| l                 | excess air ratio  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| l/min             | litre per minute  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |

| Expression          | means:  | Source  |
|---------------------|---|---|
| $l_i$               | instantaneous excess air ratio  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| m                   | metre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| m                   | metre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| m                   | metre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| m                   | meter   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $m^3$               | cubic-metre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| max                 | maximum value   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $M_{CO_2,ref}$      | reference CO <sub>2</sub> mass [g]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| mg                  | milligram   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| mg/km               | milligramme per kilometre   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| $mgas, 3s, k$       | 3 second moving average mass flow of the exhaust gas component “gas” in time step k given in 1 Hz resolution [g/s] ; for PN in [# /s]                 |   |
| $mgas, i$           | Instantaneous mass of the exhaust component “gas” at time step i, [g/s]; for PN in [# /s]   |   |
| $m_{gas,i}$         | mass of the exhaust component “gas” [g/s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| min                 | minute  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| $M_k$               | number of samples for urban, rural and motorway shares with positive acceleration greater than 0.1 m/s <sup>2</sup>                                   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| $\bar{m}_t$         | is the weighted distance-specific mass of gaseous pollutants [mg/km] or particle number [# /km], respectively emitted over the complete trip          |   |
| $m_t$               | is the mass of gaseous pollutant [g] or particle number [#] emissions, respectively emitted over the complete trip                                    |   |
| $m_{t,CO_2}$        |   | is the mass of CO <sub>2</sub> [g] emitted over the complete trip                         |
| $\bar{m}_u$         | is the weighted distance-specific mass of gaseous pollutants [mg/km] or particle number [# /km], respectively emitted over the urban part of the trip |   |
| $m_u$               | is the mass of gaseous pollutant or the particle number emissions, respectively emitted over the urban part of the trip [mg]                          |   |
| $m_{u,CO_2}$        |   | is the mass of CO <sub>2</sub> [g] emitted over the urban part of the trip                |
| Mw gas,d            | Weighted distance-specific emissions for the exhaust gas component “gas” for the entire trip, [g/km]; for PN in [# /km]                               |   |
| $M_{gas,PN,d}$      | Weighted distance-specific emissions for the exhaust gas component “PN” for the entire trip, [# /km]  |   |
| $M_{gas,d,U}$       | Weighted distance-specific emissions for the exhaust gas component “gas” for the subsample of all   |   |
| $M_{PN,d,U}$        | Weighted distance-specific emissions for the exhaust gas component “PN” for the subsample of all  |   |
| $M_{CO_2,d}$        | is the distance-specific mass of CO <sub>2</sub> [g/km] for a test in charge sustaining mode over the WLTC  |   |
| N                   | Number of vehicle emission types  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 26, Version 07 Jun 17  |
| N <sub>2</sub> O    | Nitrous oxide   | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| NH <sub>3</sub>     | Ammonia   | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| $N_k$               | number of windows for urban, rural, and motorway shares reference points P1, P2, P3   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| $N_k$               | total number of samples for the urban, rural and motorway shares and the complete trip  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| NMHC                | Non-methane hydrocarbons  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| NO                  | Nitric oxide  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| NO <sub>2</sub>     | Nitrogen dioxide  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| NO <sub>x</sub>     | Oxides of nitrogen  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17                |
| NO <sub>x,dry</sub> | moisture-corrected mean concentration of the stabilized NO <sub>x</sub> recordings  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| NO <sub>x,m</sub>   | mean concentration of the stabilized NO <sub>x</sub> recordings   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |



| Expression                              | means:   | Source   |
|---|--|--|
| $\overline{NO}_{x,ref}$                 | reference mean concentration of the stabilized $NO_x$ recordings   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17  |
| $\overline{NT}$                         | Minimum number of vehicle emission types   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 26, Version 07 Jun 17 |
| $\overline{p}_{e1} = 19 \text{ km/h}$   | degree centigrade  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17  |
| $\overline{p}_{e2} = 56.6 \text{ km/h}$ | degree centigrade  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17  |
| $\overline{p}_{e3} = 92.3 \text{ km/h}$ | Phase of WLTC (low, medium, high and extra-high), $p=1-4$  |  |
| $P_a$                                   | Particulate mass collected on the background filter  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17               |
| $P_{C,j}$                               | Wheel power class limits for class j, [kW] ( $P_{C,j}$ , lower bound represents the lower limit $P_{C,j}$ , upper bound the upper limit) |  |
| $P_{C,norm, j}$                         | Wheel power class limits for class j as normalised power value, [-]  |  |
| $P_{drag}$                              | Engine drag power in the Veline approach where fuel injection is zero, [kW]  |  |
| $P_{drive}$                             | Power demand at the wheel hubs for a vehicle at reference speed and acceleration [kW]  |  |
| $P_e$                                   | Particulate mass collected on the sample filter  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17               |
| $p_e$                                   | evacuated pressure [kPa]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17  |
| $PMR_H$                                 | highest power-to-mass-ratio of all vehicles in the PEMS test family  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 26, Version 07 Jun 17 |
| $PMR_L$                                 | lowest power-to-mass-ratio of all vehicles in the PEMS test family   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 26, Version 07 Jun 17 |
| $P_{norm}$                              | Normalised power demand at the wheel hubs [-]  |  |
| ppm                                     | parts per million  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17  |
| ppm                                     | parts per million  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17  |
| ppm $C_1$                               | parts per million carbon equivalent  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17  |
| ppm $C_1$                               | parts per million carbon equivalents   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17  |
| $P_{r, i}$                              | Power demand at the vehicles wheel hubs to overcome driving resistances in time step i [kW]  |  |
| $P_{r,,i}$                              | Same as $P_{required,i}$ defined above used in longer equations  |  |
| $P_{rated}$                             | Rated engine power   | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17               |
| $P_{rated}$                             | Maximum rated engine power as declared by the manufacturer, [kW]   |  |
| $P_{required,i}$                        | Power to overcome road load and inertia of a vehicle at time step i, [kW]  |  |
| $P_{w,3s,k}$                            | 3 second moving average power demand at the vehicles wheel hubs to overcome driving  |  |
| $P_{w,net}(norm)$                       | Full load power curve, [kW]  |  |
| $q_{i,reg,U}$                           | time-corrected exhaust mass flow rate [kg/s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $q_{m,r}$                               | raw exhaust mass flow rate [kg/s]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $q_{maw,i}$                             | instantaneous intake air mass flow rate [kg/s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $q_{mew,i}$                             | instantaneous exhaust mass flow rate [kg/s]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $q_{mf,i}$                              | instantaneous fuel mass flow rate [kg/s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $q_{vs}$                                | volume flow rate of the system [l/min]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17  |
| $r$                                     | cross-correlation coefficient  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $r^2$                                   | coefficient of determination   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17  |
| $r^2$                                   | coefficient of determination   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17  |
| $r^2$                                   | coefficient of determination   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $R_{CDA}$                               | Charge-depleting actual range  | Commission Regulation (EU) 2017/xxx, Annex XXI, point 4, Version 07 Jun 17               |
| $\rho_e$                                | density of the exhaust   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $\rho_{gas}$                            | density of the exhaust component "gas"   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |
| $r_h$                                   | hydrocarbon response factor  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17  |

| Expression  | means:   | Source  |
|---|--|---|
| $road_{grade,1}(d)$   | smoothed road grade at the discrete way point under consideration $d$ after the first smoothing run  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $road_{grade,2}(d)$   | smoothed road grade at the discrete way point under consideration $d$ after the second smoothing run | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| RPA   | Relative Positive Acceleration   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| rpm   | revolutions per minute   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| rpm   | revolutions per minute   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| s   | second   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| s   | second   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| s   | second   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| sin   | trigonometric sine function  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| SPF   | Standardised Power Frequency distribution  |   |
| t   | time [s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| t   | time passed since test start [s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $t_0$   | time point of gas flow switching [s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $t_0$   | time passed at the measurement directly located before the respective way point $d$ [s]              | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $t_{1,j}$   | first second of the $j^{\text{th}}$ averaging window [s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| $t_{10}$  | time point of 10% response of the final reading  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $t_{2,j}$   | last second of the $j^{\text{th}}$ averaging window [s]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| T4253H  | compound data smoother   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| $t_{50}$  | time point of 50% response of the final reading  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $t_{90}$  | time point of 90% response of the final reading  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| tbd   | to be determined   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| tc,j  | Time share of the wheel power class j, [%]   |   |
| te  | end time of the WLTC phase p, [s]  |   |
| The equation of a1 is deleted from Appendix 6, and the equation of a1 is in point 3.1.3 of Appendix7b in M11 version. But that is different from in Appendix 6 in M10 version. How should a1 is calculated? |  |   |
| $t_i$   | Total time in step i, [s]  |   |
| $t_{i,j}$   | total time in step $i$ considering window $j$ [s]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| $m$   | Test mass of the vehicle   | Commission Regulation (EU) 2017/xxx correcting act, point 2a, Version 10 Nov 16           |
| $M$   | Test mass of the vehicle, [kg]; to be specified per section: real test weight in PEMS test, NEDC     |   |
| $tol_1$   | primary tolerance  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| $tol_2$   | secondary tolerance  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17 |
| ts  | Start time of the WLTC phase p, [s]  |   |
| $u_{gas}$   | $u$ value of the exhaust component "gas"   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| v   | vehicle speed [km/h]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| v(t)  | vehicle speed at a data point t [km/h]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $v_{k\_eng\_max}$   | maximum engine volume of all vehicles within the PEMS test family                                    | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 26, Version 07 Jun 17  |
| $v_{3s,k}$  | 3 seconds moving average of the vehicle velocity in time step k, [km/h]                              |   |
| $v_i$   | Actual vehicle speed in time step i, [km/h]  |   |
| $v_i$   | instantaneous vehicle speed [km/h]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 35, Version 07 Jun 17 |
| $v_{iRk}$   | Reference velocity for $P_{drive}$   | Commission Regulation (EU) 2017/xxx correcting act, point 2a, Version 10 Nov 16           |

| Expression       | means:   | Source  |
|------------------|--|---|
| $v_{ref}$        | Reference velocity for Pdrive , [70 km/h]  |   |
| $V_s$            | system volume [l]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 1, point 2, Version 07 Jun 17   |
| w                | weighing factor for windows  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| x                | independent variable or reference value  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| x                | actual value of the reference signal   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| y                | dependent variable or measured value   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| y                | actual value of the signal under validation  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 3, point 2, Version 07 Jun 17   |
| $\alpha$         | molar hydrogen ratio (H/C)   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $\beta$          | molar carbon ratio (C/C)   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $\gamma$         | molar sulphur ratio (S/C)  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $\Delta$         | difference   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| $\Delta$         | difference   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| $\delta$         | molar nitrogen ratio (N/C)   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $\Delta t_{t,i}$ | transformation time t of the analyser [s]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $\Delta t_{t,m}$ | transformation time t of the exhaust mass flow meter [s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $\epsilon$       | molar oxygen ratio (O/C)   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 2, Version 07 Jun 17   |
| $\chi_{min}$     | minimum value  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 2, point 2, Version 07 Jun 17   |
| $h_j$            | weighing factors for urban, rural and motorway shares  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | distance of window j to the CO <sub>2</sub> characteristic curve [%]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | severity index for urban, rural and motorway shares and the complete trip  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | mass or particle number of the exhaust component "gas" [g] or [#]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | mass or particle number of the exhaust component "gas" in window j [g] or [#]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | distance-specific emission for the exhaust component "gas" [g/km] or [# /km]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | distance-specific emission for the exhaust component "gas" in window j [g/km] or [# /km]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | total time in step i [s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| $tol_1$          | primary tolerance for the vehicle CO <sub>2</sub> characteristic curve [%]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
| $tol_2$          | secondary tolerance for the vehicle CO <sub>2</sub> characteristic curve [%]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | duration of a test [s]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | average speed of windows [km/h]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | actual vehicle speed in time step i [km/h]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | average vehicle speed in window j [km/h]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | average speed of the Low Speed phase of the WLTP cycle   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | average speed of the Extra High Speed phase of the WLTP cycle  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | weighing factor of window j  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | Average emission value of an exhaust gas component in the wheel power class j, [g/s]; for PN in [# /s]                                     | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 4, point 15, Version 07 Jun 17  |
|                  | Weighted emission value of an exhaust gas component "gas" for the subsample of all seconds i with $v_i < 60$ km/h, [g/s]; for PN in [# /s] |   |
| $\bar{v}_j$      | Average vehicle speed in the wheel power class j, km/h   |   |
| $\bar{v}_U$      | Weighted vehicle speed in the wheel power class j, [km/h]  |   |
| $a_i$            | acceleration in time step i [m/s <sup>2</sup> ]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |

| Expression                   | means:  | Source  |
|------------------------------|---|---|
| $a_{pos}$                    | positive acceleration greater than 0.1 m/s <sup>2</sup> [m/s <sup>2</sup> ]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17   |
| $a_{pos,i,k}$                | positive acceleration greater than 0.1 m/s <sup>2</sup> in time step i considering the urban, rural and motorway shares [m/s <sup>2</sup> ]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17   |
| $a_{res}$                    | acceleration resolution [m/s <sup>2</sup> ]<br>distance covered in time step i [m]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17   |
| $RPA_k$                      | distance covered in time step i considering the urban, rural and motorway shares [m]<br>relative positive acceleration for urban, rural and motorway shares [m/s <sup>2</sup> or kW/(kg*km)]<br>duration of the urban, rural and motorway shares and the complete trip [s]<br>vehicle speed [km/h]<br>actual vehicle speed in time step i [km/h]<br>actual vehicle speed in time step i considering the urban, rural and motorway shares [km/h] | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17<br>Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17<br>Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17<br>Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17<br>Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17<br>Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17<br>Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17 |
| $\bar{v}_k$                  | average vehicle speed for urban, rural and motorway shares [km/h]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 31, Version 07 Jun 17   |
| $(v \cdot a_{pos})_k^{[95]}$ | 95 <sup>th</sup> percentile of the product of vehicle speed and positive acceleration greater than 0.1 m/s <sup>2</sup> for urban, rural and motorway driving [m <sup>2</sup> /s <sup>3</sup> or W/kg]  | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17   |
| $RPA_k$                      | relative positive acceleration for urban, rural and motorway driving [m/s <sup>2</sup> or kW/(kg*km)]   | Commission Regulation (EU) 2017/xxx, Annex IIIA, appendix 7a, point 40, Version 07 Jun 17   |
| $IC_k$                       | is the distance share of usage of the internal combustion engine for an OVC-HEV over the RDE trip   |   |
| $d_{ICE,k}$                  | is the distance driven [km], with the internal combustion engine on for an OVC-HEV over the RDE trip  |   |
| $d_{EV,k}$                   | is the distance driven [km], with the internal combustion engine off for an OVC-HEV over the RDE trip   |   |
| $M_{RDE,k}$                  | is the final RDE distance-specific mass of gaseous pollutants [mg/km] or particle number [# /km]  |   |
| $m_{RDE,k}$                  | is the distance-specific mass of gaseous pollutant [g/km] or particle number [# /km] emissions, emitted over the complete RDE trip and prior to any correction in accordance with this Appendix   |   |
| $M_{CO_2,RDE,k}$             |   | is the distance-specific mass of CO <sub>2</sub> [g/km], emitted over the RDE trip  |
| $M_{CO_2,WLTC,k}$            |   | is the distance-specific mass of CO <sub>2</sub> [g/km], emitted over the WLTC cycle  |
| $M_{CO_2,WLTC_CS,k}$         | is the distance-specific mass of CO <sub>2</sub> [g/km], emitted over the WLTC cycle for an OVC-HEV vehicle tested on its charge sustaining mode  |   |
| $r_{ratio}$                  | ratio between the CO <sub>2</sub> emissions measured during the RDE test and the WLTP test  |   |
| $RF_k$                       |   | is the result evaluation factor calculated for the RDE trip   |
| $RF_{L1}$                    |   | is the first parameter of the function used to calculate the result evaluation factor   |
| $RF_{L2}$                    | is the second parameter of the function used to calculate the result evaluation factor  |   |