
Changes to legislation: There are currently no known outstanding effects for the Commission Implementing Decision of 13 March 2013 on the approval of the use of light emitting diodes in certain lighting functions of an M1 vehicle as an innovative technology for reducing CO₂ emissions from passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council (Text with EEA relevance) (2013/128/EU), Division 4.. (See end of Document for details)

ANNEX

Methodology for determining the reduction in CO₂ emissions due to the use of LED lights in the low beam headlamps, the high beam headlamps, and the licence plate lamps

4. DETERMINATION OF THE REDUCTION IN CO₂ EMISSIONS DUE TO THE SAVINGS IN THE ELECTRIC POWER CONSUMPTION

In order to quantify the impact of the electric power consumption on the CO₂ emissions the vehicle is to be tested on a chassis dynamometer by running a hot start NEDC test as specified in Annex 4a to Regulation No 83 of the Economic Commission for Europe of the United Nations (UN/ECE) — Uniform provisions concerning the approval of vehicles with regard to the emission of pollutants according to engine fuel requirements⁽¹⁾.

In order to ensure repeatability of the measurement, the power of the additional electrical load must be significantly higher than the potential electrical power saving of the LEDs (the saving is less than 40 W). An additional load causing an extra electrical power production of the alternator of ~750 W is to be therefore selected.

In total 10 hot start NEDC tests are to be performed of which five with and five without the additional load of ~750 Watt. In order to minimise the variability of the test results, the oil temperature, ambient temperature, and the time between the experiments are to be monitored and kept constant at the start of the test.

For these variables and for the road load setting the following specifications are to be followed:

- the road load setting of the chassis dynamometer is to be determined according to the procedure for the calibration of the dynamometer as defined in Annex 7 to Regulation No 83 (UN/ECE);
- the engine is to be warmed up at the start of the test, i.e. the oil temperature shall be $92\text{ °C} < T < 96\text{ °C}$;
- the ambient temperature is to be $22,0\text{ °C} < T < 23,8\text{ °C}$;
- the time between the tests is not to exceed 45 minutes.

The following measurements are to be performed:

- the electric output of the alternator measured with the additional electric load of ~750 W (5 tests) (potentiometer) and without the additional load (5 tests);
- CO₂ emissions.

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- (1) [OJ L 42, 15.2.2012, p. 1.](#)

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