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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

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1. Introduction

Regulation (EU) 2024/1257 (the Euro 7 Regulation)[1] on emission type-approval of motor vehicles was adopted in 2024 to improve air quality, in line with the objectives of the European Green Deal. This Regulation builds on the Euro 6 emission regulation for light-duty vehicles (LDVs)[2] and the Euro VI emission regulation for heavy-duty vehicles (HDVs) and introduces new provisions to regulate brake emissions, tyre abrasion and in-vehicle battery durability for both light- and heavy duty vehicles. Just as Euro 6 and Euro VI, also Euro 7 requires that vehicles respect the emission limits for a specified period of time, called the 'main lifetime'. This is necessary to make sure that emissions requirements are not only fulfilled during type-approval, but also in practice when vehicles are in use. The main lifetime is described in Table 1 of Annex IV to the Euro 7 Regulation. Since the 'main lifetime' does not reflect the average lifetime of vehicles in the Union, Article 6(5) of Euro 7 introduces an 'additional lifetime' period, in which the scope of Euro 6 and Euro VI has been extended by 25 per cent beyond the vehicle's 'main lifetime'. The concept of durability multipliers is introduced to account for the deterioration of emission reduction systems beyond the main lifetime.

Durability multipliers for LDVs and buses of category M_2 have been established in the Euro 7 Regulation, Annex IV Table 2. Deterioration multipliers for HDVs – and in particular vehicles of category M_3, N_2 and N_3 – have not yet been laid down in the Euro 7 Regulation. Therefore, that Regulation requests the Commission in Article 18(3) to assess the durability performance of HDVs with regard to emissions by 31 December 2025 before setting out these durability multipliers. A technical assessment was conducted on behalf of the Commission by the Consortium for ultra–LOw Vehicle Emissions (CLOVE), which comprises a group of specialised research, testing and certification organisations.

In this Communication to the European Parliament and the Council, the Commission shares the findings of the technical assessment[3] and concludes which durability multipliers should be set out for the HDV categories in Table 2 of Annex IV to Euro 7[1].

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[1] Regulation (EU) 2024/1257 of the European Parliament and of the Council of 24 April 2024 on type-approval of motor vehicles and engines and of systems, components and separate technical units intended for such vehicles, with respect to their emissions and battery durability (Euro 7), amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No 715/2007 and (EC) No 595/2009 of the European Parliament and of the Council, Commission Regulation (EU) No 582/2011, Commission Regulation (EU) 2017/1151, Commission Regulation (EU) 2017/2400 and Commission Implementing Regulation (EU) 2022/1362 (OJ L, 2024/1257, 8.5.2024, ELI: http://data.europa.eu/eli/reg/2024/1257/oj)

[2] Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) (OJ L 171, 29.6.2007, p. 1, ELI: http://data.europa.eu/eli/reg/2007/715/oj)

[3] European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Plakolmer, B., Hausberger, S. and Weller, K., *Durability of Euro 7 heavy-duty vehicle emissions – Technical report – LOT2*, Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2873/7305552

2. Regulatory background

2.1. Historical background

Vehicle emission regulations in Europe have progressively incorporated lifetime requirements and 'deterioration factors'. Such lifetime requirements ensure that emission performance is maintained not only at the time of type-approval, but throughout the useful life of the vehicle. Deteroriation factors are multipliers or added fixed values, designed to cover the expected emissions increase due to wear and degradation of emission control technology[4]. For the establishment of these factors, it should be considered that the variety of situations for heavy-duty vehicles is significantly broader than for light-duty vehicles, since it should cover all driving patterns and other engine use cases. Therefore this required a much more complex and rigorous investigation, also due to their longer service lives and more diverse operating conditions.

Deterioration factors for LDVs were introduced in the early 1990s[5]. At that time, manufacturers had to demonstrate, through accelerated ageing tests, that emission control systems remained effective over the specified useful life – typically 80 000 kilometres. Later, the introduction of on-board diagnostics and real-driving emissions testing improved the accuracy and enforcement of durability requirements.

In contrast, HDVs face greater challenges because they typically operate for longer periods, often exceeding 700 000 kilometres or seven years, under more variable and harsh conditions. In 2005, the Euro IV[6] emission legislation introduced deterioration factors for HDVs. Manufacturers could either apply fixed deterioriation factor as laid down by the legislation or conduct ageing tests to demonstrate actual deterioration. In the latter case, they needed to demonstrate that under the specified deterioration factors, the gaseous and particulate emissions of an engine family or engine aftertreatment system family complied with the appropriate emission limits over the appropriate durability period.

[4] E.g. catalytic converters, sensors and exhaust gas recirculation systems.

[5] First in Council Directive 91/441/EEC. Council Directive 91/441/EEC of 26 June 1991 amending Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles (OJ L 242, 30.8.1991, p. 1, ELI: http://data.europa.eu/eli/dir/1991/441/oj)

[6] Commission Directive 2005/78/EC of 14 November 2005 implementing Directive 2005/55/EC of the European Parliament and of the Council on the approximation of the laws of the Member States relating to the measures to be taken against the emission of gaseous and particulate pollutants from compression-ignition engines for use in vehicles, and the emission of gaseous pollutants from positive ignition engines fuelled with natural gas or liquefied petroleum gas for use in vehicles and amending Annexes I, II, III, IV and VI thereto (OJ L 313, 29.11,2005, p. 1, ELI: http://data.europa.eu/eli/dir/2005/78/oj)

2.2. Euro 7

The Euro 7 Regulation, introduces lifetime requirements for both light- and heavy-duty vehicles. These lifetime requirements consist of a 'main lifetime' and an 'additional lifetime'. Table 2 of Annex IV to the Euro 7 Regulation provides for durability multipliers to take account of deterioration over the additional lifetime (see Table 1).

Within the main lifetime, the emission limits as stated in Table 2 of Annex I to Euro 7 are valid. For the additional lifetime, the emission limit values must be multiplied by the relevant durability multiplier, indicated in Table 1[7].

Durability multipliers	**M_1, N_1 and M_2**	**N_2, $N_3 \leq 16$ t, $M_3 \leq 7{,}5$ t**	**$N_3 > 16$ t, $M_3 > 7{,}5$ t**
Durability multiplier for additional lifetime	1,2 for gaseous pollutants		

Table 1 - Durability multiplier table from Euro 7

The Euro 7 Regulation already introduced a durability multiplier of 1,2 for LDVs and vehicles of category M_2. This effectively means that the limit values for gaseous emissions are increased by 20% when a vehicle reaches the additional lifetime, by distance or age. For HDVs, durability multipliers still need to be established. To this end, the following provision is laid down in Article 18(3) of Euro 7: 'By 31 December 2025, the Commission shall submit to the European Parliament and to the Council a report assessing the durability performance of heavy-duty vehicles with regard to emissions.' On the basis of that report, the Commission is empowered in accordance with Article 15 (1) (f) to set out the durability multipliers in Table 2 of Annex IV.

The durability multiplier must be determined for two groups of HDVs, depending on the vehicle category and the maximum vehicle mass. Table 2 sets out the main and additional lifetimes for both groups of HDVs[8].

Lifetime of vehicles	**N_2, $N_3 \leq 16$ t, $M_3 \leq 7{,}5$ t**	**$N_3 > 16$ t, $M_3 > 7{,}5$ t**
Main lifetime	300 000 km or 8 years, whichever comes first	700 000 km or 12 years, whichever comes first
Additional lifetime	375 000 km or 10 years, whichever comes first	875 000 km or 15 years, whichever comes first

Table 2 - Main and additional vehicle lifetimes from Euro 7

[7] From Table 2 of Annex IV to Regulation (EU) 2024/1257 of the European Parliament and of the Council of 24 April 2024 on type-approval of motor vehicles and engines and of systems, components and separate technical units intended for such vehicles, with respect to their emissions and battery durability (Euro 7).
[8] From Table 1 of Annex IV to Regulation (EU) 2024/1257 of the European Parliament and of the Council of 24 April 2024 on type-approval of motor vehicles and engines and of systems, components and separate technical units intended for such vehicles, with respect to their emissions and battery durability (Euro 7).

3. Assessment of durability multipliers

3.1. Vehicle database

Since Euro 7 heavy-duty vehicles are not yet on Europe's roads, an assessment based on test data from these vehicles was not feasible. The assessment therefore used several relevant sources of emissions data, based on the latest technology used in Euro VI diesel vehicles. Given the limited increased stringency of Euro 7 compared to Euro VI, using data from the latest Euro VI vehicles is deemed the most appropriate approach on short term. In line with the establishment of deterioration factors of LDVs, an assessment based on diesel emissions is assumed to be valid for other engine designs too.

The test data used were retrieved from:

- testing multiple vehicle pairs of the same vehicle manufacturer and model, with at least one vehicle having a low mileage (<100 000 km) and one having a high mileage (near or above main lifetime mileage). Most of the vehicle pairs had the latest Euro VI technology on board (steps D or E);
- databases containing on-road emissions data from all vehicles and remote sensing data from previous testing;
- test data and estimations from truck manufacturers;
- engine test bed results from US regulatory test cycles.

3.2. Method

The technical assessment used different methods to calculate deterioration of the emission reduction system's performance. For the vehicle pairs tested, emissions at the end of the main lifetime and at the end of the additional lifetime were estimated by extrapolation. The difference in emissions was subsequently compared against the Euro 7 emission limits. For other data sets, both extrapolation and linear regression were used to estimate the deterioration, depending on the dataset type. The method separated results for lighter HDVs, such as light trucks and city buses (N_2, $N_3 \leq 16$ t, $M_3 \leq 7{,}5$ t) and for heavier HDVs such as heavy trucks and coaches ($N_3 > 16$ t, $M_3 > 7{,}5$ t). It also distinguished between different emission components, i.e. NO_x, NH_3, N_2O, CO, HC, CH_4, NMOG and PN_{23}. Extreme outliers in terms of observed deterioration were not considered, as these outliers were detected in vehicles with malfunctions or in vehicles that were tampered with.

3.3. Results of the technical assessment performed by CLOVE

3.3.1. Lighter heavy-duty vehicles

The durability values obtained through the assessment for lighter heavy-duty vehicles according to different methodologies are shown in Table 3. According to the data presented in the table, a value of 1,2 would represent a typical durability multiplier for diesel engines. This assessment is mainly based on measurements of technology in vehicles with emission standard Euro VI steps D or E, as these vehicles are, from a technological standpoint, the most comparable to Euro 7 vehicles.

Exhaust emission com-ponent	**TUG/ FVT[9]**	**HBEFA[10] 4.2**	**HBEFA 5.1**	**Remote sensing**	**US27 (SwRI[11]) – measure-ment value + add-on emissions**	**US27 (SwRI) – Euro 7 WHTC[12] limit + add-on emissions**	**OEM 1**	**OEM 2**	**Plume chasing**
NO_x	1,17	1,26	1,18	1,07-1,23	1,09	1,01	1,2-1,3	1,20	1,17
NH_3	1,09		1,29						
N_2O	0,93		1,16		0,88	0,98			
CO	1,01	1,12	1,10	1,08	1,22	1,03			
HC			1,29		1.05	1,02			
CH_4	1,00				1,19	1,00			
NMOG	1,10								
PN_{23}	1,00	1,00	1,00						

Table 3 - Results for lighter HDVs (N_2, $N_3 \leq 16$ t, $M_3 \leq 7,5$ t)

[9] Technical University Graz (Austria) - Forschungsgesellschaft für Verbrennungskraftmaschinen und Thermodynamik (Research Association for Internal Combustion Engines and Thermodynamics)
[10] Handbook Emission Factors for Road Transport
[11] Southwest Research Institute
[12] World Harmonized Transient Cycle

3.3.2. Heavier heavy-duty vehicles

The results for heavier heavy-duty vehicles are similar to those for lighter HDVs and are shown in Table 4. Here also, according to the data presented in the table, a value of 1,2 would represent a typical durability multiplier for diesel enignes. Again, the assessment mainly focusses on vehicles with emission standard Euro VI steps D or E, as these vehicles are, from a technological standpoint, the most comparable to Euro 7 vehicles.

Exhaust emission com-ponent	**TUG/ FVT**	**HBE FA 4.2**	**HBE FA 5.1**	**Remote sensing**	**US27 (SwRI) – measure-ment value + add-on emissions**	**US27 (SwRI) – Euro 7 WHTC limit + add-on emissions**	**OEM 1**	**OEM 2**	**Plume chasing**
NO_x	1,20	1,25	1,19	1,09-1,30	1,09	1,01	1,16-1,20	1,20	1,05
NH_3	1,06		< 1						
N_2O	0,99		< 1		0,88	0,98			
CO	1,00	1,08	1,09	1.06	1,22	1,03		1,02	
HC			1,26		1.05	1,02		1,01	
CH_4	1,01				1,19	1,00			
NMOG	1,01								
PN_{23}	1,01	1,00	1,00					1,01	

Table 4 - Results for heavier HDVs (N_3 > 16 t, M_3 > 7,5 t)

4. Conclusions

The conclusion from the technical assessment based on available Euro VI data on emission performance deterioriation, proposes a durability multiplier of 1,2 for Euro 7 vehicles. The assessment considers multiple exhaust emission components for setting the durability multiplier. Vehicles with emission standard Euro VI steps D or E are used for the assessments, as these vehicles are, from a technological standpoint, the most comparable to Euro 7 vehicles. A durability multiplier of 1,2 is in line with the durability multiplier for light-duty vehicles and buses of category M_2.