



Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Pollution and Energy****Eightieth session**

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Item 3(a) of the provisional agenda

Light vehicles: UN Regulations Nos. 68 (Measurement of the maximum speed, including electric vehicles), 83 (Emissions of M₁ and N₁ vehicles), 101 (CO₂ emissions/fuel consumption) and 103 (Replacement pollution control devices)**Proposal for amendments to the 06 and 07 series of amendments to UN Regulation No. 83 (Emissions of M1 and N1 vehicles)****Submitted by the expert from the International Organization of Motor Vehicle Manufacturers***

The text reproduced below was prepared by the expert from the International Organization of Motor Vehicle Manufacturers (OICA). This document proposes to introduce new definition and clarify 'permanent emission default mode'. The modifications to the current text of the Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

A. Definition of term “permanent”

Annex 11, paragraph 2.14., amend to read:

"2.14. "Permanent emission default mode" refers to a case where the engine management controller permanently switches to a setting that does not require an input from a failed component or system where such a failed component or system would result in an increase in emissions from the vehicle to a level above the limits given in paragraph 3.3.2. of this annex.

2.14.1. Permanent in this context means that the default mode is not recoverable, i.e. the diagnostic or control strategy that caused the emission default mode cannot run in the next driving cycle and cannot confirm that the conditions that caused the emission default mode is present anymore. All other emission default modes are considered to be not permanent."

Annex 11, add a new paragraph 2.21.:

"2.21. "Limp-home routines" means any default mode other than emission default mode."

Annex 11, paragraph 3.5.1., amend to read:

"3.5.1. The OBD system shall incorporate a malfunction indicator readily perceivable to the vehicle operator. The MI shall not be used for any other purpose except to indicate emergency start-up, **emission default modes** or limp-home routines which effect the emission system to the driver. The MI shall be visible in all reasonable lighting conditions. When activated, it shall display a symbol in conformity with ISO 2575. A vehicle shall not be equipped with more than one general purpose MI for emission-related problems. Separate specific purpose tell tales (e. g. brake system, fasten seat belt, oil pressure, etc.) are permitted. The use of red colour for an MI is prohibited."

B. Introduction of special denominator

Annex 11, paragraph 7.3.2., amend to read:

"7.3.2. In addition to the requirements of paragraph 7.3.1. of this appendix:

- (a) Secondary air system monitor denominator(s) shall be incremented if the commanded "on" operation of the secondary air system occurs for a time greater than or equal to 10 seconds. For purposes of determining this commanded "on" time, the OBD system may not include time during intrusive operation of the secondary air system solely for the purposes of monitoring.
- (b) Denominators of monitors of systems only active during cold start shall be incremented if the component or strategy is commanded "on" for a time greater than or equal to 10 seconds.
- (c) The denominator(s) for monitors of Variable Valve Timing (VVT) and/or control systems shall be incremented if the component is commanded to function (e.g., commanded "on", "open", "closed", "locked", etc.) on two or more occasions during the driving cycle or for a time greater than or equal to 10 seconds, whichever occurs first.
- (d) For the following monitors, the denominator(s) shall be incremented by one if, in addition to meeting the requirements of this paragraph on at least one driving cycle, at least 800 cumulative kilometres of vehicle operation have been experienced since the last time the denominator was incremented:

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- (i) Diesel oxidation catalyst;
 - (ii) Diesel particulate filter.
- (e) Without prejudice to requirements for the increment of denominators of other monitors the denominators of monitors of the following components shall be incremented if and only if the driving cycle started with a cold start:
- (i) Liquid (oil, engine coolant, fuel, SCR reagent) temperature sensors;
 - (ii) Clean air (ambient air, intake air, charge air, inlet manifold) temperature sensors;
 - (iii) Exhaust (EGR recirculation/cooling, exhaust gas turbo-charging, catalyst) temperature sensors;
- (f) The denominators of monitors of the boost pressure control system shall be incremented if all of the following conditions are met:
- (i) The general denominator conditions are fulfilled;
 - (ii) The boost pressure control system is active for a time greater than or equal to 15 seconds.
- (g) **Manufacturers may request to use special denominator conditions for certain components or systems if it can be demonstrated to the Type Approval Authority by submitting data and/or an engineering evaluation that other conditions are necessary to allow for reliable detection of malfunctions. The Type Approval Authority shall only approve such requests if the manufacturer provides data and/or an engineering evaluation that supports the necessity of a special denominator."**

II. Justification

A. Definition of term “permanent”

1. This proposal defines the terms “limp-home routine” and clarifies “permanent emission default mode” in UN Regulation No. 83.
2. The term “permanent” is not further specified and leaves room for different interpretations. A more precise definition of the term “permanent” in the context of emission default modes would be appreciated to make the Regulation more comprehensive.
3. Activating the MI is only necessary in case the emissions exceed the applicable OBD thresholds due to the activated “permanent emission default mode” (paragraphs 3.5.2. and 2.14.).
4. “Permanent” can be considered as not recoverable in the next driving cycle, i.e. the diagnostic or control strategy that caused the emission default mode cannot run in the next driving cycle again and cannot confirm that the condition that caused the emission default mode is not present anymore. A short or a temporary default mode, e.g. for component protection, is recoverable and therefore not seen as permanent.
5. “Limp-home routines” means any default mode other than emission default mode. For example, a limp-home routine could be a limitation of vehicle speed or engine power due to safety related failures within the stability control.

B. Introduction of special denominator

6. The current definitions of the specific denominators are based on engine aftertreatment system combinations which are designed as one TWC for gasoline vehicles and DOC, DPF and SCR respectively NSC for diesel engines.
7. Upcoming emission requirements will bring up additional aftertreatment components like Gasoline Particulate Filters (GPF) or new designs with more than one SCR catalyst. Such new systems or catalyst combinations might require specific conditions to enable the monitoring, especially when their purpose is designed for such conditions.
8. In case of a SCR system with two catalyst bricks, where one is mounted close to the engine and the other one further downstream, the NOx aftertreatment would be dependent on temperature conditions. The downstream SCR would be used for NOx aftertreatment mainly during high load and the resulting temperature conditions, e.g. during a regeneration. Based on that the NOx conversion capability could only be monitored during comparable conditions.



