

## **Proposal for amendments to Regulation No. 49 (Compression ignition and positive ignition (LPG and CNG) engines)**

The text reproduced below was prepared by the expert from the International Organization of Motor Vehicle Manufacturers (OICA) to adapt the requirements related to fuel injection malfunction monitoring (OBD) to the current state of technology. The modifications to the current text of Regulation No. 49, Revision 6, are marked in bold for new or strikethrough for deletion.

It shall be noted that the current requirements are kept as an option left to these manufacturers that have already agreed with their approval authority to implement a monitoring solution that differs from that which is specified.

### **I. Proposal**

*Annex 9A, paragraphs 2.3.1.*, amend to read:

"2.3.1. Malfunctioning injectors

**As an alternative to the monitor specified in line (d) of the table in item 7 of Appendix 3 to Annex 9B to this Regulation, the manufacturer may opt for complying with the provisions specified in paragraphs 2.3.1.1. to 2.3.1.2.1. of this Annex."**

*Annex 9B, Appendix 3, Item 7*, amend to read:

"Fuel System monitoring

The OBD system shall monitor the following elements of the fuel system on engines so-equipped for proper operation:

	<i>Diesel</i>	<i>Gas</i>
(a) Fuel system pressure control: fuel system ability to achieve the commanded fuel pressure in closed loop control - performance monitoring.	X	
(b) Fuel system pressure control: fuel system ability to achieve the commanded fuel pressure in closed loop control in the case where the system is so constructed that the pressure can be controlled independently of other parameters - performance monitoring.	X	
(c) Fuel injection timing: fuel system ability to achieve the commanded fuel timing for at least one of the injection events when the engine is equipped with the appropriate sensors - performance monitoring.	X	
(d) <b>Fuel injection quantity: fuel system ability to achieve the commanded fuel quantity by detecting errors from desired fuel quantity in at least one of the injection events (e.g. in pre- main- or post-injection) – emission threshold monitoring.</b>	X	
(e) Fuel injection system: ability to maintain the desired air-fuel ratio (incl. but not limited to self-adaptation features) – performance monitoring.		X

## **II. Justification**

1. Monitoring of clogged injection systems has been introduced in the legislation in order to prevent a high level of Particulate Matter emissions in the case when a partial failure of the Diesel Particulate Filter would occur simultaneously.

Currently, no specific monitoring technique is specified, but it is required that, at stage C, each manufacturer presents to its Type Approval Authority a monitoring technique to detect the eventual clogging of injectors.

2. Having in mind that a clogged injection system will always affect the fuel quantity delivery, it is proposed to transpose into UN Regulation No. 49 (Revision 6) the provisions regarding the "ability of the system to achieve the commanded fuel quantity" that are specified in Global Technical Regulation No. 5.

3. The current requirements would remain unchanged, and be considered as an alternative left to the manufacturer to the "per default" fuel delivery monitoring technique. This permits that manufacturers that already agreed with their Type Approval Authority on another monitoring technique would not be penalised by the "last minute change".

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