



Emissions Regulation and Odometer protection/accuracy

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Emission Regulations

- Consecutive Euro emission standards improved the emission control of Internal Combustion Engines
- Testing of pollutant emissions is dependent on mileage since all mechanical/chemical systems deteriorate with time/use
- Euro 6, VI and Euro 7 regulations include durability requirements linked to km, as well as anti-tampering requirements (which for Euro 6 and Euro 7 explicitly cover odometer)
- Accurate and tamper-proof odometer readings are therefore essential in order to test compliance with the emissions regulation

Possible tampering

- Odometer:
 - Manipulation of the value for higher resale prices
 - programming new mileage, freezer or filter to slow down the odometer writing
- Emissions:
 - Manipulation of DPF / SCR / EGR for lower fuel / reagent consumption
 - Emulators, dummy-DPF/SCR/EGR, reprogramming (deactivation)
- Battery
 - Potential manipulation of SoH / charging / capacity



JRC TECHNICAL REPORTS

Vehicles Odometer and Emission Control Systems

Digital Tampering and Countermeasures

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Joint
Research
Centre

Euro 6 Implementing rules

- **Regulation (EU) 2017/1151:** The manufacturer shall submit a description of the provisions taken to prevent **tampering** with and modification of the **emission control computer, odometer** including the recording of mileage values for the purposes of the requirements of Annexes XI and XVI.

...

Any reprogrammable computer codes or operating parameters **shall be resistant to tampering** and afford a level of protection at least equivalent to that afforded by the provisions of the standard ISO 15031-7:2013 (Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 7: Data link security).

Manufacturers **shall include systematic tamper-protection** strategies and write-protect features to protect the integrity of the odometer reading.

EURO 6 for cars, vans

EURO VI for buses, lorries

ICE vehicles



Electric and H2 vehicles



Euro 7
for cars, vans, buses, lorries

Simplification of legislation and testing
Longer lifetime coverage
Digital monitoring of compliance (OBM)
Brake particles *and* Microplastics from tyres

Fuel- and technology-neutral emission limits:
NOx, particles, hydrocarbons, CO, ammonia, ...

In-vehicle battery durability (*complementing Battery Regulation*)

Durability of Emissions

- Example for Euro 7, but durability requirements already exist in Euro 6/VI

ANNEX IV

LIFETIME REQUIREMENTS

Table 1: Lifetime of vehicles, engines and pollution control systems

Lifetime of vehicles, engines and replacement pollution control devices	M ₁ , N ₁ and M ₂	N ₂ , N ₃ <16t, M ₃ <7.5t:	N ₃ >16t, M ₃ >7.5t
Main lifetime	Up to 160 000 km or 8 years, whichever comes first	300 000 km or 8 years, whichever comes first	700 000 km or 15 years, whichever comes first
Additional lifetime	After main lifetime and up to 200 000 km or 10 years whichever comes first	After main lifetime and up to 375 000 km	After main lifetime and up to 875 000 km

Battery Durability



- New UN Global Technical Regulation 22 on battery durability adopted
- Introduces **monitors of state of health for batteries** installed in vehicles
- Minimum performance requirements for battery durability introduced for cars/vans reflecting current market situation (not best in class)

Vehicle age/usage	PHEV	BEV
Until 5 years/100.000 km	80%	80%
Up to 8 years/160.000 km	70%	70%

Euro 7

- Article 4:
7. Manufacturers shall design, construct and assemble vehicles of categories M1, M2, M3, N1, N2 and N3 in such a way to minimise vulnerabilities, arising in all **phases of their life-cycle**, that may lead to **tampering** with the following:
 - a) Fuel and reagent injection system
 - b) Engine and engine control units
 - c) Traction batteries
 - d) Odometer** and
 - e) Pollution control systems

Euro 7 proposal

- **Article 4)**

8. The manufacturer shall prevent the possibility of **exploiting vulnerabilities** referred to in paragraph 7. When such a vulnerability is found, the manufacturer shall remove the vulnerability, by software update or any other appropriate means.

9. The manufacturers shall ensure the secure transmission of data related to emissions and battery durability by taking cybersecurity measures in accordance with UN Regulation 155.

- **Article 6:** Manufacturers shall ensure that OBFCM, OBD and OBM devices **and anti-tampering** measures installed in these vehicles comply with the provisions of this Regulation as long as the vehicle is in use.

- **Article 12:** Economic operators and independent operators shall not **tamper** with the vehicle and its systems. National authorities shall, during in-service conformity or market surveillance checks, verify whether manufacturers of vehicles have correctly installed excess emissions driver warning systems, low-reagent driver warning systems and whether vehicles can be **tampered**.

- **Annex V, Table 2:**

Anti-tampering, security and cybersecurity: required by Market Surveillance Authorities; Documentation + Declaration by OEMs to Type Approval Authorities

Possible solutions for odometer tampering-1



Database on EU- or national level

Does not protect during initial phase, i.e. before first PTI
Issues with data protection and consistency of data (VIN transferred if not done during PTI)



Certification following “Common Criteria”

Tachograph is certified at EAL4 (Common Criteria)



Hardware Secure Module (HSM);

Mandatory to use only on mileage value for the whole vehicle

Possible solutions for odometer tampering-2

- Strong enforcement can be done by Market Surveillance Authorities in the EU
- Guidance on the identification of the presence of Defeat Devices with regards to emissions of light- duty vehicles approved with Real Driving Emissions (RDE), heavy-duty vehicles and on anti- tampering protection **(Commission Notice 2023/C 68/01)**
- Proposed methodology for Odometer and emission control systems tampering protection
- Check if a vehicle can be manipulated
- Easy check with cheap equipment in the case of odometer, more complex for emission control systems

II
(Information)
INFORMATION FROM EUROPEAN UNION INSTITUTIONS, BODIES, OFFICES
AND AGENCIES

EUROPEAN COMMISSION

COMMISSION NOTICE

Guidance on the identification of the presence of Defeat Devices with regards to emissions of light-duty vehicles approved with Real Driving Emissions (RDE), heavy-duty vehicles and on anti-tampering protection

(2023/C 68/01)

DISCLAIMER

This guidance notice complements Notice C(2017) 352 final, which addressed the presence of defeat devices in pre-RDE light-duty vehicles. It reflects the discussions of the expert meetings of the Forum on Type Approval and Market Surveillance. The meetings involved the Commission services and experts from the Member States.

It is intended to facilitate the implementation of Regulation (EC) No 715/2007⁽¹⁾ and Regulation (EC) No 595/2009⁽²⁾ for light and heavy-duty vehicles respectively. It is itself not legally binding. Any authoritative reading of the law should only be derived from those Regulations and other applicable legal texts or principles, like Commission Regulation (EU) No 2017/1151⁽³⁾ and Commission Regulation (EU) No 582/2011⁽⁴⁾ including all their amending acts. While this note seeks to assist authorities and operators by presenting good practices for an effective implementation of the applicable law, only the Court of Justice of the European Union is competent to authoritatively interpret Union legislation.

1. Introduction

The concept of a defeat device is an integral part of European vehicle emissions legislation. Both the definition and the prohibition (including some exceptions) of defeat devices for light-duty vehicles are clearly spelled out in Regulation (EC) No 715/2007, Articles 3(10) and 5(2). For heavy-duty vehicles this prohibition is prescribed in Regulation (EC) No 595/2009, Article 5(3) (see Annex I).

The compatibility of certain kind of defeat devices has been subject of several requests for a preliminary ruling before the Court of Justice. The Court has addressed this question in case C-693/18, where the Court considered, *inter alia*, the exception to the prohibition on the use of defeat devices must be interpreted strictly⁽⁵⁾. Furthermore, the Court has decided in cases C-128/20, C-134/20 and C-145/20, that a defeat device which, under normal driving conditions, operated during most of the year in order to protect the engine from damage or accident and ensure the safe operation of the vehicle could not fall within the exception provided for in Article 5(2)(a) of Regulation (EC) No 715/2007⁽⁶⁾.

⁽¹⁾ OJ L 171, 29.6.2007, p. 1.

⁽²⁾ OJ L 188, 18.7.2009, p. 1.

⁽³⁾ OJ L 175, 7.7.2017, p. 1.

⁽⁴⁾ OJ L 167, 25.6.2011, p. 1.

⁽⁵⁾ Paragraph 112 of the judgement in Case C-693/18.

⁽⁶⁾ Point 2 of the judgements in cases C 128/20, C 134/20 and C 145/20 of 14 July 2022.

Possible solutions for odometer accuracy

STEPS:


 Testing method for odometer accuracy is needed

 Validation of the method in various labs required

 Setting accuracy requirements [in UNR 39]

 Add strong market surveillance measures

 Direct reference to UNR 39 may be made in Euro 7 implementing rules (*timing is crucial*)

 **Priority:** Odometer Accuracy of M1, N1 vehicles

Thank you for your attention