Real-world fuel consumption of passenger cars
Part I: Test manipulations & exploitation of loopholes
The gap between official and on-road fuel consumption keeps growing

The gap between official laboratory-based CO₂ emission measurements and real-world performance of new passenger cars has been growing consistently for 15 years now: While in 2001 the average deviation from type-approval fuel consumption levels came to 9%, by 2012 it had more than tripled to about 28%, and in 2015 it reached an average value of around 42%. During this time, there has been no change in the EU test procedure for measuring CO₂ emissions.

New passenger cars are not becoming as efficient as manufacturers officially state. In reality, CO₂ emissions from new passenger cars are not decreasing but, at best, remaining stable. The growing CO₂ gap undermines EU climate protection efforts as EU CO₂ emission standards for passenger cars - a major plank in the EU climate policy – are based on manufacturers’ misleading CO₂ emission values. The gap further translates into unexpected fuel expenses for consumers. According to the International Council on Clean Transportation (ICCT), the gap costs consumers about 450€ per year, on average.

![Average divergence between official and real-world fuel consumption of new passenger cars](image-url)
How has the widening of the CO₂ gap been possible?

Type-approval CO₂ emissions from passenger cars are currently measured in a laboratory on a chassis dynamometer (a roller test bench) following a standardized driving cycle. The aerodynamic and rolling resistance values of the test vehicle, which are needed to adjust the dynamometer, are determined on an outdoor track before laboratory testing. On the track, the vehicle is first accelerated to a certain target speed and then allowed to coast until it comes to a full stop.

For type-approval tests, carmakers use pre-series vehicles that deviate significantly from production ones. Further, test vehicles are illegally prepared in a way that renders them useless for real driving conditions: To lighten the car and reduce its rolling resistance during the coast-down test, manufacturers over inflate the tires, seal doors and radiator grilles with tape, take off exterior mirrors, use slightly sloped test tracks, and, in some cases, even remove the car doors.
Once in the lab, the test is conducted with all ancillary loads, such as air conditioning or lights, turned off, as foreseen by the regulation. Thus, the impact that these have on fuel consumption is not reflected at all in the test result. In addition, manufacturers exploit test loopholes and measurement flexibilities and, for example, interrupt battery charging by switching off the alternator or declare a CO₂ value that can be up to 4% below the actual test result.

On top of this, some manufacturers use so-called defeat devices: They install software that detects when the vehicle is undergoing emissions testing and then employs a low fuel consumption mode that is specifically designed for the test cycle. For example, a software discovered by the California Air Resources Board (CARB) lowers the fuel consumption of the car as long as the steering wheel does not move, as is the case on a test bench. As soon as the steering wheel is turned by more than 15 degrees, the software switches to a regular mode with higher fuel consumption.

These practices are not mere legal tricks but intentional consumer deception. By increasingly making use of them, carmakers manage to reduce fuel consumption and CO₂ emissions – on paper.

Car manufacturers are obliged to issue honest fuel consumption figures. The corresponding EU Regulation 715/2007 stipulates that type-approval CO₂ and air pollutant emissions have to be aligned with those emitted on-road throughout the normal life of the vehicle under normal conditions of use. **All intentional deviations between laboratory and on-road performance are therefore an infringement of the legislation and should be penalized.**

**In recent years, car manufacturers have increasingly manipulated type-approval tests. Manipulations cannot be excluded if the declared values are not controlled by an independent body.**
We need an independent official body to monitor real-world fuel consumption.

We urge national governments to appoint an independent official body that monitors real-world CO₂ emissions and conducts independent inspections of randomly selected production cars. Vehicles should also be tested in case of suspicion of noncompliance. Official fuel consumption values should be corrected if the deviation between type-approval fuel consumption and the ex-post control measurement exceeds 4%. This is already common practice in the U.S., where the Environmental Protection Agency (EPA) compels manufacturers to correct their declared fuel consumption data if a discrepancy of more than 4% is detected. Further, the U.S. EPA discloses frauds and imposes fines worth hundreds of millions of dollars in the event of a violation. The EU surveillance body should also be empowered to issue vehicle recalls and impose adequate penalties for transgressions.

In the future, car buyers must be able to rely on official CO₂ emission figures.
This document is Part I of a series of brief papers dealing with the discrepancy between official and real-world fuel consumption in the EU. Please visit the campaign website to find out more: www.get-real.org

The aim of our project “Get Real: Demand fuel figures you can trust” is to improve consumer rights, to advocate against misleading practices in the frame of type approval, and to strengthen market surveillance. As part of the campaign, we want to make public illegal practices such as the detection of test stands or the use of test vehicles that deviate significantly from production ones. At the same time, we want to encourage authorities and policy makers to enforce existing regulations and conduct in-use conformity inspections, to correct misleading type-approval values, and, in the event of fraudulent practices, impose penalties that are „effective, proportionate and dissuasive“ (EU Regulation 715/2007).

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