

## Exhaust emissions inspection and maintenance for motor vehicles Evaluation of the effectiveness and efficiency

### Key facts

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Once on the road, all motor vehicles are subject to two types of periodic checks. The first is **compulsory emissions testing and maintenance**, which is carried out by private garages. Here the different auto parts that make up the vehicle's exhaust system have to be inspected, adjusted and if necessary replaced. The second check is **periodic official inspection**, performed by the **cantonal vehicle licensing offices**. As far as air quality is concerned, the purpose of both checks is to ensure that the exhaust system components continue to function correctly over the vehicle's entire service life.

Official statistics show a definite improvement in air quality in recent decades, not least due to stricter exhaust emissions standards for motor vehicles. Since 1980, the level of airborne pollutants caused by road traffic has declined by between 40% and 80%, depending on the toxic emission in question. The new exhaust after-treatment systems of modern cars are far more efficient at filtering emissions and are also more reliable than previous systems. With petrol-driven passenger cars especially, their reliability has been significantly enhanced thanks to effective *catalytic converters* and *on-board diagnostic (OBD) systems*. During compulsory emissions testing, faults were detected in just 5% of the petrol-driven cars fitted with this equipment. Compulsory inspection was therefore effectively redundant in 95% of cases – and produced no environmental benefit either.

Many garages do not perform the compulsory inspection of vehicle exhaust systems thoroughly, and this is reflected in the generally low prices charged and short average times taken to complete the inspection and maintenance work. In particular, the full mandatory procedures for inspecting and maintaining all the parts related to the vehicle's exhaust system are often not carried out. Instead, many garages simply rely on the results of the emissions measured at the exhaust pipe outlet, or the data on the vehicle's emissions read off from the on-board diagnostic system. As long as the readings are satisfactory, the mechanic then confirms that the inspection and maintenance were carried out by issuing the relevant emissions test certificate. But it is impossible to detect all faults in this way, especially when emissions are measured from the exhaust while the vehicle is unladen (i.e. at idling speed). The annual cost of exhaust emissions inspection and maintenance for all vehicle groups is estimated to be in the region of CHF 165 million.

Roadside checks by the police and periodic official inspection by cantonal vehicle licensing offices are also performed to check vehicle emissions. Although the cantons use a common quality assurance system (asaQSS) for official vehicle emissions checks, the Swiss Federal Audit Office (SFAO) has identified significant differences regarding the frequency and thoroughness of emissions testing. Furthermore, the test results from each canton are not collated to provide a nationwide snapshot of the shortcomings identified in the areas of vehicle emissions, safety and noise pollution.

Given that faults are so rare in the exhaust after-treatment systems fitted in *petrol-driven passenger cars with on-board diagnostics*, the current inspection interval stipulated for this vehicle group can be extended. The Swiss Federal Audit Office proposes two possible variants here (**see Recommendation 1**). Other vehicle groups – including heavy motor vehicles – often tend to exhibit worse

pollution levels than petrol-driven passenger cars with OBD systems. Because of this, the SFAO sees no grounds for extending the inspection intervals for these other vehicle groups.

Vehicles that have not been on the road for long usually have slightly fewer faults with their exhaust systems than vehicles which have been in service for several years. Maintenance gaps are unlikely in the case of new vehicles, because most cars are now sold with manufacturers' warranties that typically run for three to five years. While the vehicle is under warranty, it is obviously in the owner's best interest to keep to the service intervals stipulated by the manufacturer, or risk invalidating the warranty. With new cars, for example, the first compulsory emissions test could be performed a year later than at present without the threat of any significant increase in airborne pollutants (**see Recommendation 2**).

The rules for inspection and maintenance intervals contained in the Road Traffic Ordinance specify a time frame of one month for completing exhaust system testing and maintenance. This is rather tight, because in practice the service dates specified by vehicle manufacturers also have to be respected in addition to compulsory emissions testing. Vehicle owners and auto service companies generally try to agree on a date when both procedures – service under warranty and compulsory emissions testing – can be carried out at the same time. The recommended time frame of three months – instead of just one – should make it easier for car owners and auto service companies to find mutually convenient dates (**see Recommendation 3**).

If, when performing a follow-up vehicle check, the cantonal authorities find that emissions testing and maintenance was not carried out, or not performed to standard, they are legally entitled to require the vehicle to undergo further maintenance or inspection. It is difficult to prove retrospectively that maintenance work was not carried out. Since many garages fail to inspect exhaust systems thoroughly, the legal position of the authorities should be strengthened so that they demand a *repeat inspection with a different auto service company* if faults are found in the vehicle's exhaust system (**see Recommendation 4**).

The savings potential of the recommendations 1 and 2 is between 15 and 22 million francs, depending upon the selected variant (**see Appendix 12**).

The Federal Office for the Environment and the Federal Office of Metrology support the recommendations of the Swiss Federal Audit Office.

The Federal Roads Office FEDRO actually intends to go beyond the recommendations of the Swiss Federal Audit Office by undertaking a comprehensive and not merely a partial revision of the regulations on compulsory emissions testing and maintenance. On the other hand, FEDRO rejects recommendation 4 (**see Appendix 14**).