

## Type-Approval Procedure

### Information System of the German Type-Approval Authority

#### **Procedure for the approval of vehicles with active air flap systems and/or sound generators (also called sound actuators) in accordance with UN Regulation No. 51, Regulation (EU) No. 540/2014 and Directive 70/157/EEC**

##### **Question or problem:**

Vehicle manufacturers are increasingly using systems to change noise behaviour (flue gas damper, sound generators, sound actuators or similar – hereinafter referred to as additional systems).

##### **Result:**

According to the Federal Motor Transport Authority (KBA), such systems comply with the provisions of UN Regulation No. 51, Regulation (EU) No. 540/2014 and Directive 70/157/EEC if the following requirements are met:

1. According to section 6.1.1. of UN Regulation No 51, the vehicle shall comply with the requirement under normal operating conditions. This includes a multitude of boundary conditions, such as corrosion resistance, behaviour under vehicle vibrations and the effects on noise behaviour beyond the test conditions. UN Regulation No. 51 ÄS 03 (Item 6.2.3.) clarified some of these boundary conditions and specified them in more detail in document GRB-68-03.
2. If the effect of additional systems on noise behaviour depends on different driving modes (e.g. influencing of transmission shift points, accelerator pedal curves) or sound design, a worst-case assessment shall be carried out. This assessment shall include all possible practical combinations of switching options. If, in the case of measurements referred to in Annex III, several modes can be considered as test modes in respect of their behaviour under all boundary conditions, the mode with the highest noise level shall be selected.
3. If there is a separate switching of the additional system by the driver, comparative measurements shall be carried out with and without the additional system being active. With regard to additional systems that cannot be switched off, one shall describe, in the concept for anti-manipulation and in the event of a fault, whether and how the additional system switches off and what effects this has on the noise behaviour of the vehicle.
4. The noise behaviour of intended functionalities, such as backfire, shall comply with the regulation under normal operating conditions (see 1.).
5. The stationary noise shall be determined for all noise-relevant modes and documented in the test report.
6. The principle applies that what is not documented in the approval is not approved and represents a deviation from conformity in the event of any influence on the noise behaviour of the vehicle. This principle does not apply solely to the behaviour of the vehicle under type test conditions, but also under normal operating conditions (see 1.).
7. Besides the normal silencing system, additional systems for changing the noise behaviour shall be described. This applies to drawings and information (e.g. manufacturer and part number) which identify the additional systems on the vehicle, as well as information on the basic func-

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tions of these systems. Different modes shall be described, if present. Furthermore, the software identification used for type testing shall be mentioned. If a software change impacts on the approved behaviour of the additional system, the changed software identification shall be indicated by means of an extension.

8. This may preferably be done in the test report or in the information document. The principle that 'every modification shall be notified to the Type Approval Authority' applies to changes in hardware and software.
9. The KBA requires a manufacturer's declaration that any exceptional noise behaviour of the additional system (e.g. jumping behaviour) is not to be expected for the area outside ASEP (20 - 80 km/h) either. The declaration shall at least cover the area from the document GRB-68-03.
10. The manufacturer is expected to provide a comprehensible description of the concept for anti-manipulation and in the event of an error. A description how the risk of manipulation of the control unit and the signal transmission by unauthorised third parties is mitigated. Faults in the additional system shall be detected and lead to the shutdown of the additional system. The use of a control lamp to provide the driver with supplementary information on the shutdown of the additional system is permitted.
11. If the manufacturer is unable to implement a concept against tampering by unauthorised third parties in the case of new type approvals by the date of application of this document, the manufacturer shall submit a strategy how such measures can be introduced by the next possible date of application, but no later than 1 January 2020.

#### Application of the actual state:

The principles of this interpretation of the requirements shall, as far as possible, be implicitly applied to the approval of motorcycles and to the approval of replacement silencing systems for motor vehicles and motorcycles. It shall continue to apply to silencing systems with additional systems approved in accordance with UN Regulation No 51, Regulation (EU) No 540/2014 and Directive 70/157/EEC with regard to the documentation of additional systems and the worst-case assessment of these additional systems under normal operating conditions.

Regardless of this document, the issue of the Verkehrsblatt published on 15 March 2018 shall be considered with regard to retrofitted sound generators.

If certain vehicles have already been type-approved in the past and have not included the above-mentioned test principles, they shall be taken into account for the next extension of the approval. Insofar as the test vehicle is no longer available, test results will be accepted if they are conducted with another technically suitable vehicle and the technical service can confirm the transferability of the test results.

The procedure described in this document is mandatory for the type approval procedure as of 1 September 2019 and replaces the IST 03-18.

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