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**EMIS hearing of 11 October 2016**

Questions to Mr Zinke (KBA)
The EMIS committee has received answers from several national Type Approval Authorities (TAA) following its questionnaires sent to Member States. Asked what happens in case of failure of the type approval procedure, the answers received divert significantly: “The law does not forbid a manufacturer to apply to another authority; We have no knowledge whether it is allowed to approach another TAA (in case of failure); With such a decision (failure) the manufacturer shall not be able to apply in another member state and the decision of refusal shall be communicated to all Member States; If testing failed with a technical service, the manufacturer is allowed to contact another technical service. A manufacturer can apply for type approval to only one approval authority.”

How do we ensure that TAA are well aware of the EU rules and indeed apply them equally? Do technical services retest failed cars, without being aware of it? Do technical services exchange information on previous tests?

In general, it is up to the individual Member States to ensure that their national authorities cope with their responsibilities and are efficient in doing so. Furthermore, the harmonised provisions with regard to type approval and in particular to the reduction of exhaust emissions have to be clearly framed and phrased to make sure that there are distinct and precise requirements to be met by the authorities, the technical services and the manufacturers regarding their responsibilities. The regular exchange of information between the type approval authorities themselves and with the European Commission, which is already taking place, should be intensified further.

The technical services conduct the technical tests that are necessary to obtain type approval. For the sake of uniformity and legal certainty alone, the technical services also need absolute clarity on test procedures so that conducting the tests will automatically deliver the same results irrespective of which technical service conducted them. Currently, the technical services do usually not exchange information on their test objects. So far, the following reasons have been stated for this:

1. It would cause a considerable administrative burden for all notified technical services to request information from other bodies, not only in Europe, but also worldwide for UNECE-related matters.
2. Proving unequivocally that the tested vehicles, systems or components are technically completely identical is only possible by exercising major efforts and preparing extensive documentation.
3. The necessary information concerns business or industry secrets.

In addition to that, there is nothing to prevent manufacturers from improving a certain vehicle and presenting it again to a technical service after it had failed the test in the first place. It is mainly clear test criteria that will help to prevent manipulations.
The report of the investigation committee “Volkswagen” contains only very limited information on the KBA’s testing approach, the procedure and especially KBA’s communication with the OEMs. Would you be willing to make the arguments and discussions that KBA had with OEMs, information that you received from OEMs as well as the minutes and the testing protocols available to our committee? Why didn’t KBA already publish this additional information with the report?

In the report, the basic data were processed with a view to the objective of the investigation. However, the data themselves comprise business and industry secrets and can therefore not be published. Such industry secrets concern, inter alia, the precise technical data and specifications of the aggregates affected and, in particular, the necessary description of their functions as well as the control and switch strategies used. The documents describe the state of technological development within a given company. This features explanations on technological solutions that are not generally known in detail and would therefore be valuable information to competitors. Consequently, disclosing this kind of information would produce major damage to the business concerned. Business secrets concern details of planned market strategies regarding measures that are to be taken, which may influence the market position of the business affected in case they become known, as well as details on the itemization of the vehicles affected, as these could be relevant for the market position and/or competitiveness of a business. This influence can be reflected e.g. in competitors adjusting the timing of their marketing strategies or in changes in the price structure for the supply of vehicle components that are necessary for the envisaged measures. Furthermore, it is possible to draw conclusions from the contents of these documents about business and/or industry secrets of those involved. It is possible for informed readers to draw conclusions from the information contained in the documents provided as to whether and to what extent the business concerned will probably be able to adhere to legal provisions. With this competition-relevant knowledge, competitors could gain a marketplace advantage.
Why did KBA conduct only 56 measurement tests in 53 cars? Why didn’t KBA perform multiple tests with multiple cars of the same type in order to obtain sounder results?

Conducting 56 vehicle tests within a relatively short period of time was an enormous challenge and achievement for everybody involved and required considerable additional financial resources. For some of these 56 vehicles, which represent a considerable share (approximately 80%) of the German market for diesel vehicles, up to 8 different time-consuming tests were conducted (duration of an entire test programme per vehicle under ideal conditions was 4 days). Therefore, considerable stress was put both on the available test facilities of the technical services recognized by the KBA and the required technical staff.

Independently acquiring used vehicles for test purposes, which was necessary as many of these vehicles are no longer in production, is far from easy and also takes up a considerable amount of time. However, I would also like to point out that the KBA has tested more vehicles after the report was completed and will continue to do so.

The KBA agreed with Volkswagen on the recall of fraudulent cars that includes, among other things, an update of the software of the engine control unit, i.e. the deletion of the so called “acoustic function.” How does your authority make sure that the OEM complies with this agreement? Which instruments or procedures have you developed to check compliance?

The KBA has drawn up performance specifications for the tests (see enclosure). Before the retrofit plans for certain vehicle types are cleared, specific tests have to be successfully completed in accordance with the performance specifications. These tests are commissioned and monitored by the KBA. The necessary recall of the vehicles that was imposed on Volkswagen is being monitored. The manufacturer has to inform the KBA of the VIN of the retrofitted vehicles. The KBA will take retrofitted vehicles off the roads to check them. In the future, the regular main inspection will also comprise a check on whether the new software was installed properly.
The KBA has accused Fiat Chrysler of using an illegal cheat device to switch off exhaust treatment systems, however the Italian authorities have denied this and said that the cars conform to current emissions rules and do not contain defeat devices. Can you please present the KBA’s conclusions with regard to FIAT’s emission control strategy and explain why you believe it is illegal under Regulation 715/2007? What was the response of the Italian authorities? And what follow up action will you be taking? What obstacles are there to the KBA removing type approval from FIAT cars affected?

The exhaust after treatment system in certain FCA vehicles reduces EGR considerably after approximately 22 minutes. Furthermore, the regeneration of the NOx storage catalyst is reduced after a specific amount of driving cycles. Both measures result in a severe increase of nitrogen oxide emissions. In our view, this reduction of the effectiveness of the emissions abatement systems is not covered by the provision. The Italian authorities did not share the German point of view, which is why the mediation procedure as set out in Article 30 (6) of Directive 2007/46/EC was initiated.

The framework directive 2007/46/EC on type approval regulates clearly the powers and responsibilities of the national authorities. It does not stipulate that an authority of a Member State is responsible for type-approved vehicles or the type approvals issued by authorities of another Member State.
Following the request by the KBA, VW submitted corrective actions they will perform on the affected cars to bring them into conformity with EU legislation. The KBA has since issued clearance to the European Approval Authorities confirming that the corrective measures will produce no changes to the vehicles’ performance. However, in the US, the EPA/CARB rejected VW (as well as Audi and Renault) recalls due to concerns about the affect the proposed fix would have on durability of all the emissions abatement equipment during the life of the vehicle: [https://www.arb.ca.gov/msprog/vw_info/vw-diesel-info/2016_07_13_audi_vw_3l_recall_rejection_cover_letter.pdf](https://www.arb.ca.gov/msprog/vw_info/vw-diesel-info/2016_07_13_audi_vw_3l_recall_rejection_cover_letter.pdf). Could you please share your assessment of the recall proposal of VW and its impact (or lack thereof) on the durability of the engine and of the emission abatement equipment (including EGR valves, LNT, DPF, SCR) and if you can guarantee that after the recall, the affected vehicles will still comply with EU requirements on durability? Can you explain why the US findings and the rejection of the proposed fix by the EPA/CARB give a negative assessment?

I cannot comment in detail on the procedures and the rejection of the proposed VW measures in the US. However, the legislation governing emissions is different in the USA and the EU. For this reason, the vehicles differ in their exhaust after treatment strategies. Therefore, this could result in different assessments.

The clearance of individual vehicle models (cluster) in Germany is effected on the basis of a clearance plan.

After the recall and retrofit measures, the required durability of the emissions abatement equipment will be demonstrated in accordance with the legal provisions governing the procedure.
How do you consider the in-house expertise in your organisation with regard to vehicles, vehicle systems, emission technologies and engine management? How much do you rely on the expertise of technical services? Do you often challenge information or arguments provided by technical services or manufacturers? How much funding and staff does your organisation have, what tasks do they perform and what is their educational background? Do you offer regular trainings and updates to ensure a high level of technical expertise? Do you consider your capacity and expertise adequate to perform your duties in an effective and efficient manner and ensure an adequate performance of vehicles with regard to safety, health and environmental protection? What procedures and arrangements do you have in place to ensure the independence and impartiality of your own organisation, what procedures do you have in place to ensure the independence and impartiality of designated technical services? Do you believe these procedures and arrangements are adequate? What is the total revenue of your organisation and what share of the revenue of your organisation comes from providing consultancy services or technical service work to car manufacturers?

The majority of our automotive engineering staff are engineers (approximately 60 staff members have a specialisation in automotive engineering, mechanical engineering or electrical engineering). Thus, the KBA has sufficient qualified staff to meet its responsibilities. Providing further education for our staff is an important and permanent task of the KBA as the technological development in the automotive sector is advancing rapidly. The technical services also have qualified staff. Within the context of the designation procedure by the KBA, these qualifications are regularly reviewed. Also, there is a system to assess the quality of the test protocols submitted by the technical services.

The KBA is a German higher-level federal authority and an executive agency of the Federal Ministry of Transport and Digital Infrastructure (BMVI). Hence, it is subject to the legal regulations and the Administrative Procedures Act. In my opinion, it is therefore guaranteed that it is independent and impartial. In 2015, the total revenue of the Technology Department of the KBA amounted to 7.4 million euros in the type approval procedure. Approximately 630,000 euros out of this revenue were proceeds from monitoring the technical services. Advice to the manufacturers and the technical services within the context of the approval procedure is free of charge.
| 7 | Do you have in place any specific procedures, checks or tests to assess the possible use of a defeat device, beyond the standard NEDC test carried out by a technical service? Do you consider it legally possible under the current rules to perform an alternative emissions test, other than the NEDC test, to verify the use of defeat devices? Could you please motivate your decision to use or not use an alternative test? What are your procedures to ensure conformity of production by manufacturers (for vehicles in production, after type approval was issued)? Do you supervise emission tests to ensure conformity of production, or do you only check the general quality management system of a manufacturer on paper? Who decides on the choice of vehicles for emission test for conformity of production checks?

The KBA has developed a test procedure to detect defeat devices (performance specifications). Within the context of the type approval procedure, it is not possible to demand practical type approval tests other than NEFC from the manufacturers. If a manufacturer submits a positive test report of a designated technical service, the approval has to be granted. As approval authority, the KBA can only take action on the basis of legal regulations. Thus, it is not possible to conduct scientific studies or tests if they are not covered by the legal regulations governing emissions. Therefore, concerning the COP, the KBA has also only conducted those tests that were legally prescribed.

In general, within the context of checking the COP of the manufacturers both monitoring methods are admissible. Concerning emissions, the manufacturers are obliged to conduct comprehensive emission tests of their vehicles themselves. This is why, in this field tests mainly refer to reviewing documents.

If the KBA has its own physical tests conducted, it is ensured that the selection of the vehicles is not done by the manufacturer. |
You have described on your web pages a system approval: a system means an assembly of devices combined to perform one or more specific functions in a vehicle and which is subject to the requirements of an international regulation.” Examples of systems are the braking or steering system of a vehicle or the mounting of wheels and tires. When a system approval tests for car emission devices are performed, does a type approval authority have any means to test the different devices in a car to find out if these different devices are designed in a way or have programs that allow them to defeat the tests. Should there be a possibility that a system is tested or could be tested also to find out if there are devices that allow the system to defeat?

When a system is subjected to type approval tests, only the legally prescribed practical tests may be conducted. It is not possible to demand that individual components be tested.

In general, type approval authorities may conduct additional tests to detect prohibited defeat devices. However, these tests should be harmonised on a European level and conducted on the basis of legal provisions. Germany has already made specific proposals for action, which the KBA is already implementing on a national level. In particular, this concerns a demand that in the type approval procedure a certificate should be furnished by the manufacturers stating whether defeat devices have been used and that it should be reviewed whether the arguments brought forward by the manufacturers meet the exception criteria as set out in Regulation (EC) No 715/2007.
The EU law (Regulation 715/2007/EC Article 5(1)) requires manufacturers to equip vehicles so as to enable the vehicle to comply with the emission limit values contained in the Regulation “in normal use”. The conclusions of KBA investigation demonstrate that on average the emission control technologies are off or turned down around 75-80% of the time making extensive use of "thermal windows", i.e. operating less efficiently below certain temperatures (20°C, 17°C, 10°C)? In addition, 48 out of 53 tested vehicles showed lower emissions levels in the conditions of the NEDC type-approval cycle (cold start) than after a warm start test. Doesn't this behaviour indicate presence of illegal defeat strategies that would render inactive or partially inactive the emission control system outside the temperature boundary conditions of the test? In addition, Article 3 point 9 subparagraph 3 of implementing Regulation 692/2008 requires manufacturer to provide the approval authority with information on the operating strategy of the exhaust gas recirculation system (EGR), including its functioning at low temperatures. Did manufacturers provide you with such required information and did you request this information from manufacturers? Do you believe that type approval authorities should have been made aware of the fact that the emission control system does not operate below certain temperatures?

At first sight, it may be startling for outsiders that the values that have been determined in terms of exhaust emissions during NEFC (cold) and NEFC (warm) differ from each other. However, technical reasons can be responsible for why emissions are higher during the second test than during the NEFC (cold). Hence, it does not automatically mean that this is due to a defeat device being used.

The NEFC cold is conducted under very restrictive repeatable conditions. With regard to preconditioning, such as loading of particle filters or NOx catalysts, the vehicle is subject to detailed regulations. Therefore, it is possible that during the subsequent cycles that are conducted without preconditioning higher emissions are measured in individual cases due to these undefined conditions such as other temperatures or loading conditions of the exhaust after treatment systems without this automatically meaning that this is due to a prohibited defeat device being used.

The provisions set out in Regulation (EC) No 692/2008 have not been phrased clearly regarding the requirements that diesel vehicles have to meet at low temperatures. Concerning the SCR exhaust after treatment systems, the requirements as to when the systems have to be working are quite clear. However, with regard to EGR, manufacturers only have to comment on its functionality at low temperatures. It is not required that the EGR meets a certain level of quality. For this reason, the information provided by the manufacturers and reviewed by the technical services in the past has not always been sufficiently detailed. This situation is remedied by the new legally enshrined requirements for manufacturers to provide information on the BES and AES, which is already demanded by the KBA.
What is your understanding of the meaning of “normal use” according to article 5.1 of Regulation 715/2007? How do you make it sure that vehicle type approved in your country respects limit in normal use? What is the purpose, in your understanding, of fixing limits of pollutants from exhaust fumes by introducing Euro classes for light vehicles? Since when you have been aware about the huge discrepancies especially for NOx in diesel car, between type approval testing and RDE? What actions, if any, have you undertaken to verify the data and fix up the problem with car type approved under your responsibility? Do you think the big discrepancies between RDE and emissions measured during test are due because of use of cheating devices or the combination of non-representative drive cycle and test on “golden cars”? Do you think that the use in type approval of "golden cars" that do not represent the behaviour of actual vehicles on the market could hinder achieving the goals of Regulation (EC) 715/2007?

Regulation (EC) No 715/2007 lacks a clear definition of “normal use”. The exact parameters were discussed for a long time as part of the new RDE legislation, too. I can state clearly that normal use goes far beyond the framework conditions set out in the NEFC. In my judgement, this refers to common driving conditions.

The discrepancies between real driving emissions and emissions determined under lab conditions had been known to the experts for a long time. Therefore, we had consultations for many years developing RDE requirements. However, I was not aware of prohibited defeat devices being used. The very comprehensive tests that we have conducted recently, showed that also used vehicles generally meet the NEFC requirements. Hence, it is not only “golden vehicles” meeting the requirements during the type approval tests.

The KBA is also a type approval authority whose tasks have been fixed by legal regulations. Independent research or activities outside the legal regulations on type approval are not admissible.

I would like to clearly point out that before the RDE legislation was introduced there were no legal limits for exhaust emissions outside NEFC. Therefore, I particularly appreciate the RDE legislation and expect that the nitrogen oxide concentration will drop measurably, especially in the cities.
Do you consider the penalties for using defeat devices as the important element and obligation by Member states in enforcing this obligation? If so, why have you failed to fulfil the obligation imposed by the article 13 of the Regulation 715/2007 to set the penalties for the use of defeat devices and to inform the Commission by 2 January 2009 about the fines for the use of defeat devices. The Member States were reminded of this obligation also in the last possible moment on 18 December 2008 in the 4th TCMV meeting? Why did you fail to notify the Commission by 2009 and did so only by 2016?

For me, the regulations which transposed the European legislation into German law or introduced the relevant implementing provisions are binding. These regulations also contain penalty provisions. The question on whether the penalties are appropriate is a politico-legal matter of how European law is applied. As head of an executive agency I cannot answer this question.

Did you conduct any testing beyond the type approval requirements, for assuring compliance with the entire Regulation 715/2007/EC, including article 5(1) and article 5(2)?

No, not in the past.
Technical tests to verify the effectiveness of the measures suggested by the Volkswagen Group regarding the restoration of the regularity of vehicles affected by notification 400-52.V/001#018 dated 14/10/2015 (status 17.12.2015_1.1)

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<td>In order to demonstrate the following requirements, the cluster suggested by Volkswagen can be applied based on the engine versions (engine displacement), on the supplier of control units and thus the technical solution, on performance level and transmissions. This will involve up to 15 test vehicles.</td>
<td>TS (prior to approval)</td>
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<td>If Volkswagen AG would like to verify the compliance with all relevant legal requirements for the other brands (currently Audi, Seat and Skoda), which are independent entities in European type-approval procedures, vehicles from these entities can be treated by analogy with Sections A-F. The Federal Motor Transport Association (KBA), in consultation with Volkswagen AG or the other entities, can communicate this to the respective authorities in the EU.</td>
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<td>This point only applies if Volkswagen AG would declare its consent for this at group level.</td>
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<td>If no further detailed information is given in Sections C-F, the technical service (TS) must justify with regard to every section why this cluster is sufficient to be able to cover the requirements in Sections C-F.</td>
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<th>A) Removal of unauthorized defeat devices</th>
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<td>The defeat devices established in notification 400-52.V/001#018 dated 14/10/2015 and equipment that has a similar effect must be removed from all the vehicles included in the notification.</td>
<td>VW (prior to approval)</td>
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<td>- This must be confirmed by the manufacturer.</td>
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The KBA will check that the emissions behavior to be established by independent tests by the manufacturer prior to issuing approval to carry out the recall extend in particular to

- standard conditions on the dynamometer in the New European Driving Cycle (NEDC),
- different environmental conditions and dynamometer settings in the NEDC,
- modified driving cycles on the dynamometer,
- the road², if necessary.

These tests will be carried out on vehicles of every engine displacement affected. The applicable test procedures and the acceptable measurement value ranges for individual pollutants will be drawn up and published by the KBA. The KBA will determine additional, technical features it deems the test vehicles must contain.

**KBA (verification testing prior to approval³)**

**B) Disclosure of authorised defeat devices**

All permitted defeat devices must be disclosed for all vehicles included in notification 400-52.V/001#018 dated 14/10/2015. The manufacturer must declare all defeat devices it considers permitted. The description must include

- the input values that trigger the device,
- the vehicle functions affected by the device activating,
- the nature and extent of the effects on the emissions behavior and other circumstances that are relevant to type approval, if necessary,
- the manufacturer must confirm that no defeat devices other than the ones it has declared and deems permitted are installed in the vehicles.

The KBA will formally assess the admissibility of the defeat devices. It will check, to the extent necessary, the nature and extent of the effects on the emissions behavior and other circumstances that are relevant to type approval independently from the manufacturer.

**KBA (prior to approval)**

**C) Verification of compliance with pollutant emissions and the durability of emission reduction devices**

The pollutant emissions⁴ including Ki and DF factors must be established by a technical service appointed by the manufacturer in accordance with Regulation (EC) No. 715/2007 or UN Regulation No. 83. Worst-case tests may be carried out on representative vehicles for this.

**VW & TS (prior to approval)**
- If the manufacturer chooses the method of a worst-case test, it must disclose its worst-case assumption. This must be justified and confirmed by the technical service appointed by it.
  - The group of vehicles included in the worst-case test must be described in essential technical parameters for the emissions behavior in an unequivocal and understandable way.
  - The technical features of the tested vehicles and the ascertained test results must be documented by the technical service.
  - Each worst-case test must be assigned in accordance with the type approvals covered by this test in compliance with Annex 1 of notification 400-52.V/001#018 dated 14/10/2015.

The KBA will check the results obtained. A technical service other than the one selected by the manufacturer shall be appointed for this task. A few clusters will be selected at random from the cluster formed by the manufacturer. For each cluster, a test vehicle with technical characteristics will be determined that fits with this cluster but does not have to correspond to the test vehicle of the manufacturer.

These tests must confirm the results ascertained by the technical service of the manufacturer.

**D) Determination of the fuel consumption values and CO₂ emissions**

The fuel consumption values and CO₂ emissions must be determined by a technical service appointed by the manufacturer in accordance with Regulation (EC) No. 715/2007 or UN Regulation 101. Due to the increased mileage, the vehicles used for testing do not have to be run against the type approval value; rather the measurement result of the vehicle with the new application data can be compared with the results of the same vehicle with the old application data.

The assessment of the test results is to be carried out in accordance with Section 5.5 of UN Regulation No. 101 as follows:

1. The vehicle will be tested with the new application version. If the first measurement of the vehicle (including new Ki factor) does not exceed the type approval value (manufacturer information or COC value) of this vehicle by more than 4%,
the existing type approval value is considered confirmed.

If the measured CO₂ value exceeds the manufacturer value by more than 4% a further test will be carried out with the same vehicle. If the average of both test results does not exceed the manufacturer value by more than 4%, the existing type approval value is considered confirmed.

If the average of both tests still exceeds the manufacturer information by more than 4%, a final test will be carried out with the same vehicle. The average of the three CO₂-new test results will be determined and used as a comparison value for the tests on the same vehicle with the old application version.

2. A further three tests will be carried out on the test vehicle using the old application version. It will calculate the average of the three CO₂-old test results (including the old Ki factor). Dividing the two averages will result in the increase factor I for the type approval values of the vehicle concepts belonging to this cluster.

\[ I = \frac{\text{CO}_2\text{-new}}{\text{CO}_2\text{-old}} \]

If \( I \leq 1 \), the existing type approval value is considered confirmed.
If \( I > 1 \), it will be multiplied by the existing manufacturer information. The results rounded up mathematically to whole figures correspond to the new type approval values for all vehicles from the tested cluster.

Worst-case tests may be carried out.

- If the manufacturer chooses the method of a worst-case test, it must disclose its worst-case assumption. This must be justified and confirmed by the technical service appointed by it.
  - The group of vehicles included in the worst-case test must be described in essential technical parameters for the fuel consumption values and CO₂ emissions in an unequivocal and understandable way.
  - The technical features of the tested vehicles and the ascertained test results must be documented by the technical service.
  - Each worst-case test must be assigned in accordance with the type approvals covered by this test.
The KBA will check the results obtained. A technical service other than the one selected by the manufacturer shall be appointed for this task. A few clusters will be selected at random from the cluster formed by the manufacturer. For each cluster, a test vehicle with technical characteristics will be determined that fits with this cluster but does not have to correspond to the test vehicle of the manufacturer.

The tests for verification will also be carried out in accordance with the above-mentioned procedure. In accordance with Section 9 of UN Regulation No. 101, the KBA reserves the right to check 3 vehicles of the same type. If the values for fuel consumption and CO₂ emissions of the manipulated vehicle are not confirmed, new values will be determined officially by the KBA.

The manufacturer has to transfer the official values to every type variant version (TVV).

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<td>KBA (prior to approval)</td>
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<td>VW (upon approval)</td>
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### E) Determination of the engine performance and the maximum torque

The engine performance and the maximum torque must be determined by a technical service appointed by the manufacturer in accordance with Regulation (EC) No. 715/2007 or UN Regulation No. 85. If a test cannot be carried out in accordance with these legal acts, a comparison measurement of complete vehicles can be carried out using the new software against the manipulated software on a suitable dynamometer for the performance measurement. If it is apparent from the comparison of the relevant application data that there are no changes to the data in the manipulated vehicles compared with the vehicles with the correct application data, this procedure can be applied as an alternative to test the representative vehicles.

The technical service appointed by the manufacturer will decide which procedure will be used and will document the process and results.

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<td>TS (prior to approval)</td>
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The KBA will check the claims or the ascertained results. A technical service other than the one selected by the manufacturer will be appointed for this task. At least one vehicle (engine) will be selected for each affected engine displacement and will be tested with regard to the engine performance and the maximum torque.

If there are deviations in the comparable vehicles (engines) between the values determined by the KBA and the manipulated vehicles,
all engine performances and maximum torques must be redetermined and assigned the relevant type approvals and TVV.

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<th>F) Determination of the noise emissions</th>
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<td>The noise emissions must be determined by a technical service appointed by the manufacturer on each vehicle with each displacement variant of the unit EA189 EU5 (1.2 l; 1.6 l; 2.0 l) in accordance with Directive 70/157/EEC or UN Regulation No. 51.</td>
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<tr>
<td>The technical service appointed by the manufacturer will decide whether the noise emissions must be determined by technical tests or there is equivalence between the manufacturer's selected technical solution and the technical solution on the manipulated vehicles. The technical service will document the procedure and the results.</td>
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<tr>
<td>If the equivalence cannot be tested by the technical service and the noise emissions cannot be determined due to the weather conditions, the manufacturer has to explain why the selected technical solution can expect to comply with the noise emission values.</td>
</tr>
<tr>
<td>The KBA will check the statements or the results obtained. A technical service other than the one selected by the manufacturer will be chosen for this. At least one vehicle for every displacement affected will be selected and tested with regard to the noise emissions.</td>
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<tr>
<td>If there are deviations in the comparable vehicles on completion of the tests between the values determined by the KBA and the manipulated vehicles, all noise values must be redetermined and assigned the relevant type approvals.</td>
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## G) Documentation

The documentation shall be made available in German. It may additionally be provided in English.

The documentation should be structured in accordance with Sections A-F. It has to contain all information noted under “Responsible”, for “VW (prior to approval)” and/or “TS (prior to approval)”. The technical service shall compile the documentation.

All documented information must be transferred to the KBA in electronic format. Test results must be entered into Excel.

The data and information recorded in the test steps by the technical service must all be provided by the KBA in electronic format.

Upon request by the KBA, the manufacturer must keep FIN-related electronic records that follow the FIN, Euro emission level reached, the CO₂ value, the fuel consumption values, the maximum engine performance and the maximum torque (data in accordance with correction measure).

## H) Costs

Volkswagen AG shall bear

- all of the costs ensuing from the appointment of technical services,
- the costs of the tests (verification testing upon approval) from Sections A, C-F that have been appointed to the technical services by the KBA,
- the expense resulting from the documents submitted with the test by the KBA, the accompanying expense associated with communication.

The KBA shall ensure that the second application of the initiated tests is carried out at prices that correspond to the quotations of the technical services for verifications for the KBA. For the third application, KBA will ensure internally that only the ensuing expense is calculated in accordance with the corresponding proposals.
1 The verification testing by the KBA should be carried out on three different models selected by the KBA from the affected cluster, whereby the model originally tested by VW is not tested. Up to 3 vehicles of each model can be tested.

2 If the weather conditions at the time of the release prevent road testing and if no suspicion arises from the dynamometer tests of the presence of an unauthorized defeat device, this will be followed up at a later date.

3 The verification testing for the presence of an unauthorized defeat device will not be carried out upon approval but prior to approval (with the exception of noise).

4 The mileage must be taken into consideration for the test vehicles. The determined exhaust emissions value must be multiplied by the coefficient that results from the formula DF_{160,000 km / DF test vehicle mileage} (DF ≥ 1). The determined DF factors or the DF factors from the regulation can be used.

5 This section has been changed in comparison to Version 0.1 as the vehicles available on the market have a 30 – 150 Tkm mileage that is significantly higher than the run-in of the regulation (up to 15 Tkm).

6 This Section has been defined in comparison to Version 0.1. In terms of the calculation, all places after the decimal point must be carried to the end result of the CO\textsubscript{2} emissions to the back-to-back test. The increase factor is calculated by dividing the value from the new application data with the value from the old application data (with 4 places after the decimal point). The integer type approval values must be multiplied by this value. Increases less than 1 g/km using the mathematical rounding rules are discounted.