



Vehicle Standard (Australian Design Rule 80/03 — Emission Control for Heavy Vehicles) 2006

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APPENDIX C

VEHICLE STANDARD (AUSTRALIAN DESIGN RULE 80/03 — EMISSION CONTROL FOR HEAVY VEHICLES) 2006

Commission Directive 2006/51/EC of 6 June 2006 amending for the purposes of adapting to technical progress Annex I to Directive 2005/55/EC of the European Parliament and of the Council and Annexes IV and V to Directive 2005/78/EC as regards requirements for the emission control monitoring system for use in vehicles and exemptions for gas engines.

COMMISSION DIRECTIVE 2006/51/EC

of 6 June 2006

amending for the purposes of adapting to technical progress Annex I to Directive 2005/55/EC of the European Parliament and of the Council and Annexes IV and V to Directive 2005/78/EC as regards requirements for the emission control monitoring system for use in vehicles and exemptions for gas engines

(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type approval of motor vehicles and their trailers ⁽¹⁾, and in particular the second indent of Article 13(2) thereof,

Having regard to Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005, on the approximation of the laws of the Member States relating to the measures to be taken against the emission of gaseous and particulate pollutants from compression-ignition engines for use in vehicles, and the emission of gaseous pollutants from positive ignition engines fuelled with natural gas or liquefied petroleum gas for use in vehicles ⁽²⁾, and in particular Article 7 thereof,

Whereas:

(1) Directive 2005/55/EC is one of the separate directives in the context of the Community type approval procedure laid down by Directive 70/156/EEC.

(2) Commission Directive 2005/78/EC of 14 November 2005 implementing Directive 2005/55/EC of the European Parliament and of the Council on the approximation of the laws of the Member States relating to the measures to be taken against the emission of gaseous and particulate pollutants from compression-ignition engines

(1) OJ L 42, 23.2.1970, p. 1. Directive as last amended by Commission 2006/28/EC (OJ L 65, 7.3.2006, p. 27).

(2) OJ L 275, 20.10.2005, p. 1. Directive as amended by Commission Directive 2005/78/EC (OJ L 313, 29.11.2005, p. 1).

for use in vehicles, and the emission of gaseous pollutants from positive ignition engines fuelled with natural gas or liquefied petroleum gas for use in vehicles and amending Annexes I, II, III, IV and VI thereto introduced amending and implementing measures in relation to the durability of emission control systems, in-use conformity over a defined useful period and on-board diagnostic (OBD) systems for new heavy duty vehicles and engines.

(3) In view of the technical progress it is now appropriate to introduce improved requirements relating to the verification of the operational conditions, failures and demonstration of the emission control monitoring system at the moment of the type approval.

(4) It is necessary to ensure that the functioning of the emission control monitoring system is not impaired by a defeat strategy.

(5) Gas engines do not use the exhaust gas recirculation or selective catalytic reduction technologies in order to fulfil the current standards for NO_x emissions. Therefore, it is considered that, at this stage, gas engines and vehicles fuelled with gas should be exempted from the requirements to ensure correct operation of NO_x control measures. The exemption might be revoked when taking into consideration further emission stages.

(6) It is appropriate to adjust the date of application of sections 6.5.3, 6.5.4 and 6.5.5 of Annex I to Directive 2005/55/EC in case of new type approvals.

(7) The Commission intends to review the OBD threshold limit values in order to adapt them to the technological progress.

(8) Directives 2005/55/EC and 2005/78/EC should therefore be amended accordingly.

- (9) The measures provided for in this Regulation are in accordance with the opinion of the Committee for Adaptation to Technical Progress established by Article 13(1) of Directive 70/156/EEC,

HAS ADOPTED THIS DIRECTIVE:

Article 1

Annex I to Directive 2005/55/EC is amended in accordance with Annex I to this Directive.

Article 2

Annex IV to Directive 2005/78/EC is amended in accordance with Annex II to this Directive.

Article 3

1. Member States shall adopt and publish, by 8 November 2006 at the latest, the laws, regulations and administrative provisions necessary to comply with this Directive. They shall forthwith communicate to the Commission the text of those provisions and a correlation table between those provisions and this Directive.

They shall apply those provisions from 9 November 2006. When Member States adopt those provisions, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

Article 4

This Directive shall enter into force on the third day following its publication in the *Official Journal of the European Union*.

Article 5

This Directive is addressed to the Member States.

Done at Brussels, 6 June 2006.

For the Commission

Günter VERHEUGEN

Vice-President

ANNEX I

AMENDMENTS TO DIRECTIVE 2005/55/EC

Annex I is amended as follows:

1. section 2.1 is amended as follows:

(a) the definition of 'defeat strategy' is replaced by the following:

' "defeat strategy" means:

- an AECS that reduces the effectiveness of the emission control relative to the BECS under conditions that may reasonably be expected to be encountered in normal vehicle operation and use,
- a BECS that discriminates between operation on a standardised type-approval test and other operations and provides a lesser level of emission control under conditions not substantially included in the applicable type-approval test procedures, or
- an OBD or an emission control monitoring strategy that discriminates between operation on a standardised type-approval test and other operations and provides a lower level of monitoring capability (timely and accurately) under conditions not substantially included in the applicable type-approval test procedures;

(b) in the definition of 'permanent emission default mode' 'permanent emission default mode' is replaced by 'emission default mode';

(c) the following definition is added:

' "emission control monitoring system" means the system that ensures correct operation of the NO_x control measures implemented in the engine system according to the requirements of section 6.5 of Annex I.;

2. in the second indent of section 6.1.5.6 'permanent emission default modes' is replaced by 'emission default modes'.

3. section 6.5 is replaced by the following:

6.5. Requirements to ensure correct operation of NO_x control measures

6.5.1. General

6.5.1.1. This section is applicable to compression-ignition engine systems irrespective of the technology used to comply with the emission limit values provided in the tables in section 6.2.1.

6.5.1.2. Application dates

The requirements of sections 6.5.3, 6.5.4 and 6.5.5 shall apply from 9 November 2006 for new type approvals and from 1 October 2007 for all registrations of new vehicles.

6.5.1.3. Any engine system covered by this section shall be designed, constructed and installed so as to be capable of meeting these requirements over the useful life of the engine.

6.5.1.4. Information that fully describes the functional operational characteristics of an engine system covered by this section shall be provided by the manufacturer in Annex II.

6.5.1.5. In its application for type-approval, if the engine system requires a reagent, the manufacturer shall specify the characteristics of all reagent(s) consumed by any exhaust aftertreatment system, e.g. type and concentrations, operational temperature conditions, reference to international standards etc.

6.5.1.6. Subject to requirements set out in section 6.1, any engine system covered by this section shall retain its emission control function during all conditions regularly pertaining in the territory of the Community, especially at low ambient temperatures.

6.5.1.7. For the purpose of type-approval, the manufacturer shall demonstrate to the Technical Service that for engine systems that require a reagent, any emission of ammonia does not exceed, over the applicable emissions test cycle, a mean value of 25 ppm.

6.5.1.8. For engine systems requiring a reagent, each separate reagent tank installed on a vehicle shall include means for taking a sample of any fluid inside the tank. The sampling point shall be easily accessible without the use of any specialised tool or device.

6.5.2. Maintenance requirements

6.5.2.1. The manufacturer shall furnish or cause to be furnished to all owners of new heavy-duty vehicles or new

heavy-duty engines written instructions that shall state that if the vehicle emission control system is not functioning correctly, the driver shall be informed of a problem by the malfunction indicator (MI) and the engine shall consequentially operate with a reduced performance.

- 6.5.2.2. The instructions will indicate requirements for the proper use and maintenance of vehicles, including where relevant the use of consumable reagents.
- 6.5.2.3. The instructions shall be written in clear and non-technical language and in the language of the country in which a new heavy-duty vehicle or new heavy-duty engine is sold or registered.
- 6.5.2.4. The instructions shall specify if consumable reagents have to be refilled by the vehicle operator between normal maintenance intervals and shall indicate a likely rate of reagent consumption according to the type of new heavy-duty vehicle.
- 6.5.2.5. The instructions shall specify that use of and refilling of a required reagent of the correct specifications when indicated is mandatory for the vehicle to comply with the certificate of conformity issued for that vehicle or engine type.
- 6.5.2.6. The instructions shall state that it may be a criminal offence to use a vehicle that does not consume any reagent if it is required for the reduction of pollutant emissions and that, in consequence, any favourable conditions for the purchase or operation of the vehicle obtained in the country of registration or other country in which the vehicle is used may become invalid.

6.5.3. Engine system NO_x control

- 6.5.3.1. Incorrect operation of the engine system with respect to NO_x emissions control (for example due to lack of any required reagent, incorrect EGR flow or deactivation of EGR) shall be determined through monitoring of the NO_x level by sensors positioned in the exhaust stream.
- 6.5.3.2. Any deviation in NO_x level more than 1,5 g/kWh above the applicable limit value given in table 1 of section 6.2.1 of Annex I, shall result in the driver being informed by activation of the MI as referred to in section 3.6.5 of Annex IV to Directive 2005/78/EC.
- 6.5.3.3. In addition, a non-erasable fault code identifying the reason why NO_x exceeds the levels specified in section 6.5.3.2 shall be stored in accordance with section 3.9.2 of Annex IV to Directive 2005/78/EC for at least 400 days or 9 600 hours of engine operation.

The reasons for the NO_x exceedance shall, at a minimum, and where applicable, be identified in the cases of empty reagent tank, interruption of reagent dosing activity, insufficient reagent quality, too low reagent consumption, incorrect EGR flow or deactivation of the EGR. In all other cases, the manufacturer is permitted to refer to a non-erasable fault code “high NO_x — root cause unknown” .

- 6.5.3.4. If the NO_x level exceeds the OBD threshold limit values given in the table in Article 4(3), a torque limiter shall reduce the performance of the engine according to the requirements of section 6.5.5 in a manner that is clearly perceived by the driver of the vehicle. When the torque limiter is activated the driver shall continue to be alerted according to the requirements of section 6.5.3.2 and a non-erasable fault code shall be stored in accordance with section 6.5.3.3.
- 6.5.3.5. In the case of engine systems that rely on the use of EGR and no other aftertreatment system for NO_x emissions control, the manufacturer may utilise an alternative method to the requirements of section 6.5.3.1 for the determination of the NO_x level. At the time of type approval the manufacturer shall demonstrate that the alternative method is equally timely and accurate in determining the NO_x level compared to the requirements of section 6.5.3.1 and that it triggers the same consequences as those referred to in sections 6.5.3.2, 6.5.3.3 and 6.5.3.4.

6.5.4. Reagent control

- 6.5.4.1. For vehicles that require the use of a reagent to fulfil the requirements of this section, the driver shall be informed of the level of reagent in the on-vehicle reagent storage tank through a specific mechanical or electronic indication on the vehicle’s dashboard. This shall include a warning when the level of reagent goes:
 - below 10 % of the tank or a higher percentage at the choice of the manufacturer, or
 - below the level corresponding to the driving distance possible with the fuel reserve level specified by the manufacturer.

The reagent indicator shall be placed in close proximity to the fuel level indicator.

- 6.5.4.2. The driver shall be informed, according to the requirements of section 3.6.5 of Annex IV to Directive 2005/78/EC, if the reagent tank becomes empty.
- 6.5.4.3. As soon as the reagent tank becomes empty, the requirements of section 6.5.5 shall apply in addition to the requirements of section 6.5.4.2.
- 6.5.4.4. A manufacturer may choose to comply with the sections 6.5.4.5 to 6.5.4.12 as an alternative to complying with the requirements of section 6.5.3.
- 6.5.4.5. Engine systems shall include a means of determining that a fluid corresponding to the reagent

characteristics declared by the manufacturer and recorded in Annex II to this Directive is present on the vehicle.

- 6.5.4.6. If the fluid in the reagent tank does not correspond to the minimum requirements declared by the manufacturer as recorded in Annex II to this Directive the additional requirements of section 6.5.4.12 shall apply.
- 6.5.4.7. Engine systems shall include a means for determining reagent consumption and providing off-board access to consumption information.
- 6.5.4.8. Average reagent consumption and average demanded reagent consumption by the engine system either over the previous complete 48 hour period of engine operation or the period needed for a demanded reagent consumption of at least 15 litres, whichever is longer, shall be available via the serial port of the standard diagnostic connector as referred to in section 6.8.3 of Annex IV to Directive 2005/78/EC.
- 6.5.4.9. In order to monitor reagent consumption, at least the following parameters within the engine shall be monitored:
- level of reagent in on-vehicle storage tank,
 - flow of reagent or injection of reagent as close as technically possible to the point of injection into an exhaust aftertreatment system.
- 6.5.4.10. Any deviation more than 50 % in average reagent consumption and average demanded reagent consumption by the engine system over the period defined in section 6.5.4.8 shall result in application of the measures laid down in section 6.5.4.12.
- 6.5.4.11. In the case of interruption in reagent dosing activity the measures laid down in section 6.5.4.12 shall apply. This is not required where such interruption is demanded by the engine ECU because engine operating conditions are such that the engine's emission performance does not require reagent dosing, provided that the manufacturer has clearly informed the approval authority when such operating conditions apply.
- 6.5.4.12. Any failure detected with respect to sections 6.5.4.6, 6.5.4.10 or 6.5.4.11 shall trigger the same consequences in the same order as those referred to in sections 6.5.3.2, 6.5.3.3 or 6.5.3.4.

6.5.5. Measures to discourage tampering of exhaust aftertreatment systems

- 6.5.5.1. Any engine system covered by this section shall include a torque limiter that will alert the driver that the engine system is operating incorrectly or the vehicle is being operated in an incorrect manner and thereby encourage the prompt rectification of any fault(s).
- 6.5.5.2. The torque limiter shall be activated when the vehicle becomes stationary for the first time after the conditions of either sections 6.5.3.4, 6.5.4.3, 6.5.4.6, 6.5.4.10 or 6.5.4.11 have occurred.
- 6.5.5.3. Where the torque limiter comes into effect, the engine torque shall not, in any case, exceed a constant value of:
- 60 % of the engine maximum torque for vehicles of category N3 > 16 tonnes, M1 > 7,5 tonnes, M3/III and M3/B > 7,5 tonnes,
 - 75 % of the engine maximum torque for vehicles of category N1, N2, N3 ≤ 16 tons, 3,5 < M1 ≤ 7,5 tonnes, M2, M3/I, M3/II, M3/A and M3/B ≤ 7,5 tonnes.
- 6.5.5.4. Requirements for documentation and the torque limiter are set out in sections 6.5.5.5 to 6.5.5.8.
- 6.5.5.5. Detailed written information fully describing the functional operation characteristics of the emission control monitoring system and the torque limiter shall be specified according to the documentation requirements of section 6.1.7.1.(b). Specifically, the manufacturer shall provide information on the algorithms used by the ECU for relating the NO_x concentration to the specific NO_x emission (in g/kWh) on the ETC in accordance with section 6.5.6.5.
- 6.5.5.6. The torque limiter shall be deactivated when the engine speed is at idle if the conditions or its activation have ceased to exist. The torque limiter shall not be automatically deactivated without the reason for its activation being remedied.
- 6.5.5.7. Deactivation of the torque limiter shall not be feasible by means of a switch or a maintenance tool.
- 6.5.5.8. The torque limiter shall not apply to engines or vehicles for use by the armed services, by rescue services and by fire-services and ambulances. Permanent deactivation shall only be done by the engine or vehicle manufacturer, and a special engine type within the engine family shall be designated for proper identification.

6.5.6. Operating conditions of the emission control monitoring system

- 6.5.6.1. The emission control monitoring system shall be operational,
- at all ambient temperatures between 266 K and 308 K (- 7 °C and 35 °C),
 - at all altitudes below 1 600 m,
 - at engine coolant temperatures above 343 K (70 °C).

This section does not apply in the case of monitoring for reagent level in the storage tank where monitoring shall be conducted under all conditions of use.

- 6.5.6.2. The emission control monitoring system may be deactivated when a limp-home strategy is active and which results in a torque reduction greater than the levels indicated in section 6.5.5.3 for the appropriate vehicle category.
- 6.5.6.3. If an emission default mode is active, the emission control monitoring system shall remain operational and comply with the provisions of section 6.5.
- 6.5.6.4. The incorrect operation of NO_x control measures shall be detected within four OBD test cycles as referred to in the definition given in section 6.1 of Appendix 1 of Annex IV to Directive 2005/78/EC.
- 6.5.6.5. Algorithms used by the ECU for relating the actual NO_x concentration to the specific NO_x emission (in g/kWh) on the ETC shall not be considered to be a defeat strategy.
- 6.5.6.6. If an AECS that has been approved by the type-approval authority in accordance with section 6.1.5. becomes operational, any increase in NO_x due to the operation of the AECS may be applied to the appropriate NO_x level referred to in section 6.5.3.2. In all such cases, the influence of the AECS on the NO_x threshold shall be described in accordance with section 6.5.5.5.

6.5.7. Failure of the emission control monitoring system

- 6.5.7.1. The emission control monitoring system shall be monitored for electrical failures and for removal or deactivation of any sensor that prevents it from diagnosing an emission increase as required by sections 6.5.3.2 and 6.5.3.4.

Examples of sensors that affect the diagnostic capability are those directly measuring NO_x concentration, urea quality sensors, and sensors used for monitoring reagent dosing activity, reagent level, reagent consumption or EGR rate.

- 6.5.7.2. If a failure of the emission control monitoring system is confirmed, the driver shall be immediately alerted by the activation of the warning signal according to section 3.6.5 of Annex IV to Directive 2005/78/EC.
- 6.5.7.3. The torque limiter shall be activated in accordance with section 6.5.5 if the failure is not remedied within 50 hours of engine operation.

The period laid down in the first subparagraph shall be reduced to 36 hours from the dates specified in Article 2(7) and 2(8).

- 6.5.7.4. When the emission control monitoring system has determined the failure has ceased to exist, the fault code(s) associated with that failure may be cleared from the system memory, except in the cases referred to in section 6.5.7.5, and the torque limiter, if applicable, shall be deactivated according to section 6.5.5.6.

Fault code(s) associated with a failure of the emission control monitoring system shall not be capable of being cleared from the system memory by any scan tool.

- 6.5.7.5. In the case of the removal or deactivation of elements of the emission control monitoring system, in accordance with section 6.5.7.1, a non-erasable fault code shall be stored in accordance with section 3.9.2 of Annex IV to Directive 2005/78/EC for a minimum of 400 days or 9 600 hours of engine operation.

6.5.8. Demonstration of the emission control monitoring system

- 6.5.8.1. As part of the application for type-approval provided for in section 3, the manufacturer shall demonstrate the conformity of the provisions of this section by tests on an engine dynamometer in accordance with sections 6.5.8.2 to 6.5.8.7.
- 6.5.8.2. The compliance of an engine family or an OBD engine family to the requirements of this section may be demonstrated by testing the emission control monitoring system of one of the members of the family (the parent engine), provided the manufacturer demonstrates to the type approval authority that the emission control monitoring systems are similar within the family.

This demonstration may be performed by presenting to the type-approval authorities such elements as algorithms, functional analyses, etc.

The parent engine is selected by the manufacturer in agreement with the type approval authority.

- 6.5.8.3. The testing of the emission control monitoring system consists of the following three phases:
Selection :

An incorrect operation of the NO_x control measures or a failure of the emission control monitoring system is selected by the authority within a list of incorrect operations provided by the manufacturer.

Qualification:

The influence of the incorrect operation is validated by measuring the NO_x level over the ETC on an engine test bed.

Demonstration:

The reaction of the system (torque reduction, warning signal, etc.) shall be demonstrated by running the engine on four OBD test cycles.

- 6.5.8.3.1. For the selection phase, the manufacturer shall provide the type approval authority with a description of the monitoring strategies used to determine potential incorrect operation of any NO_x control measure and potential failures in the emission control monitoring system that would lead either to activation of the torque limiter or to activation of the warning signal only.

Typical examples of incorrect operations for this list are an empty reagent tank, an incorrect operation leading to an interruption of reagent dosing activity, an insufficient reagent quality, an incorrect operation leading to low reagent consumption, an incorrect EGR flow or a deactivation of the EGR.

A minimum of two and a maximum of three incorrect operations of the NO_x control system or failures of the emission control monitoring system shall be selected by the type approval authority from this list.

- 6.5.8.3.2. For the qualification phase, the NO_x emissions shall be measured over the ETC test cycle, according to the provisions of Appendix 2 to Annex III. The result of the ETC test shall be used to determine in which way the NO_x control monitoring system is expected to react during the demonstration process (torque reduction and/or warning signal). The failure shall be simulated in a way that the NO_x level does not exceed by more than 1 g/kWh any of the threshold levels given in sections 6.5.3.2 or 6.5.3.4.

Emissions qualification is not required in case of an empty reagent tank or for demonstrating a failure of the emission control monitoring system.

The torque limiter shall be deactivated during the qualification phase.

- 6.5.8.3.3. For the demonstration phase, the engine shall be run over a maximum of four OBD test cycles.

No failure other than the ones which are being considered for demonstration purposes shall be present.

- 6.5.8.3.4. Prior to starting the test sequence of section 6.5.8.3.3, the emission control monitoring system shall be set to a “no failure” status.

- 6.5.8.3.5. Depending on the NO_x level selected, the system shall activate a warning signal and in addition, if applicable, the torque limiter at any time before the end of the detection sequence. The detection sequence may be stopped once the NO_x control monitoring system has properly reacted.

- 6.5.8.4. In the case of an emission control monitoring system principally based on monitoring the NO_x level by sensors positioned in the exhaust stream, the manufacturer may choose to directly monitor certain system functionalities (e.g. interruption of dosing activity, closed EGR valve) for the determination of compliance. In that case, the selected system functionality shall be demonstrated.

- 6.5.8.5. The level of torque reduction required in section 6.5.5.3 by the torque limiter shall be approved together with the general engine performance approval in accordance with Directive 80/1269/EC. For the demonstration process, the manufacturer shall demonstrate to the type-approval authority the inclusion of the correct torque limiter into the engine ECU. Separate torque measurement during the demonstration is not required.

- 6.5.8.6. As an alternative to sections 6.5.8.3.3 to 6.5.8.3.5, the demonstration of the emission control monitoring system and the torque limiter may be performed by testing a vehicle. The vehicle shall be driven on the road or on a test track with the selected incorrect operations or failures of the emission control monitoring system to demonstrate that the warning signal and activation of the torque limiter will operate in accordance with the requirements of section 6.5, and, in particular, those in sections 6.5.5.2. and 6.5.5.3.

- 6.5.8.7. If the storage in the computer memory of a non-erasable fault code is required for complying with the requirements of section 6.5, the following three conditions shall be met by the end of demonstration sequence:

- that it is possible to confirm via the OBD scan tool the presence in the OBD computer memory of the appropriate non-erasable fault code described in section 6.5.3.3 and that it can be shown to the satisfaction of the type approval authority that the scan tool cannot erase it, and,
- that it is possible to confirm the time spent during the detection sequence with the warning signal activated by reading the non-erasable counter referred to in section 3.9.2 of Annex IV to Directive 2005/78/EC, and that it can be shown to the satisfaction of the type approval authority that the scan tool cannot erase it, and,
- that the type-approval authority has approved the elements of design showing that this non-erasable information is stored in accordance with section 3.9.2 of Annex IV to Directive 2005/78/EC for a minimum of 400 days or 9 600 hours of engine operation.

ANNEX II

AMENDMENTS TO DIRECTIVE 2005/78/EC

1. Annex IV is amended as follows:

- (a) in section 3.6.4 'permanent emission default mode' is replaced by 'emission default mode';
- (b) in the second paragraph of section 3.7 'permanent emission default mode' is replaced by 'emission default mode';
- (c) section 3.8.3. is replaced by the following:

'3.8.3. In the case of MI activation due to incorrect operation of the engine system with respect to NO_x control measures, or incorrect reagent consumption and dosing activity, the MI may be switched back to the previous state of activation if the conditions given in section 6.5.3., 6.5.4 and 6.5.7. of Annex I to Directive 2005/55/EC no longer apply.';

- (d) section 3.9.2. is replaced by the following:

'3.9.2. From 9 November 2006 for new type approvals and from 1 October 2007 for all registrations, in the case of a non-erasable fault code being generated according to sections 6.5.3 or 6.5.4 of Annex I to Directive 2005/55/EC, the OBD system shall retain a record of the fault code and the hours run by the engine during the MI activation for at least 400 days or 9 600 hours of engine operation.

Any such fault code and the corresponding hours run by the engine during MI activation shall not be erased through use of any external diagnostic or other tool as referred to in section 6.8.3 of this Annex.'

2. Annex V is amended as follows:

- (a) point 2 is replaced by the following:

'2. Example of applying requirements set out in this Directive and Directive 2005/55/EC for the third approval (with, as yet, no extension) corresponding to application date B1 with OBD stage I, issued by the United Kingdom:

e11*2005/55*2005/78B*0003*00';

- (b) point 3 is replaced by the following:

'3. Example of applying requirements set out in Directives 2005/55/EC and amending Directive 2006/51/EC for the second extension to the fourth approval corresponding to application date B2, with OBD stage II, issued by Germany:

e1*2005/55*2006/51F*0004*02';

(c) the following point 4 is added:

4. Table showing the characters to be used in accordance with the different implementation dates set out in Directive 2005/55/EC:

Character	Row (*)	OBD Stage I (**)	OBD Stage II	Durability and in-use	NO _x control (***)
A	A	—	—	—	—
B	B1(2005)	YES	—	YES	—
C	B1(2005)	YES	—	YES	YES
D	B2(2008)	YES	—	YES	—
E	B2(2008)	YES	—	YES	YES
F	B2(2008)	—	YES	YES	—
G	B2(2008)	—	YES	YES	YES
H	C	YES	—	YES	—
I	C	YES	—	YES	YES
J	C	—	YES	YES	—
K	C	—	YES	YES	YES

(*) In accordance with table I, section 6 of Annex I to Directive 2005/55/EC.

(**) In accordance with Article 4 of Directive 2005/55/EC, gas engines are excluded from OBD stage I.

(***) In accordance with section 6.5 of Annex I to Directive 2005/55/EC.