



WWH-OBD

GLOBAL TECHNICAL REGULATION (GTR)
DRAFT PROPOSAL - Module B
050602

Structure of the GTR:

Module A - Rationale

Written/amended by the sponsor countries

Module B - GENERIC provisions

- Scope of the GTR
- General OBD requirements
- Generic Annexes

Module C - Emission related module

- Scope of the module: Heavy Duty Diesel engines
- Emission related OBD provisions
- Annexe to the emission related provisions

Module D - [Function 'YYY' related module]

Module E - [Function 'ZZZ' related module]

MODULE A STATEMENT OF TECHNICAL RATIONALE AND JUSTIFICATION

Module A: will be included by the sponsoring country in a later stage.

MODULE B GENERIC OBD PROVISIONS

1. SCOPE

This GTR sets out the requirements for on-board diagnostic systems to detect, record and communicate failures of specific vehicle and engine systems that affect the environmental or safety¹ performance of these systems.

2. APPLICATION

2.1. Application

The current GTR addresses:

- emission related failures from heavy-duty diesel fuelled engines used in on-road vehicles²

The scope and application of the modules of this GTR are summarised in Table 1

Vehicles / engines OB type	On-Road Heavy-Duty Diesel			
Generic requirements	Module A & B			
Exhaust Emissions	Module C			

Table 1
Scope of the modules

¹ The current GTR only establishes requirements for emission related OBD systems. Requirements addressing safety related OBD systems may be added at a later date in accordance with future decisions of WP29.

² Heavy-duty engines are for the purpose of emission related OBD those engines that are certified to regulated emission standards on an engine test-bed (see section 2.1 of module C)

2.2. Routes for certification

The routes for certification shall be at the discretion of the contracting parties of the "1998" agreement.

3. Definitions

3.1. OBD

"On Board Diagnostic system (OBD)" means a system on-board a vehicle or engine which has the capability of detecting malfunctions, of indicating their occurrence by means of a malfunction indicator, of identifying the likely area of these malfunctions by means of information stored in computer memory, and communicating that information off-board.

3.2. Malfunction

"Malfunction" means a failure or deterioration of a vehicle or engine system, including the OBD system, that may affect the environmental, safety or overall performance of these systems, as defined in the specific modules of this gtr

3.3. Component monitoring

"Component Monitoring" means the monitoring of input components for electrical circuit failures and rationality failures and monitoring of output components for electrical circuit failures and functionality failures

3.3.1. Rationality failure

"Rationality failure" means a malfunction where the signal from an individual sensor or component is at variance with that expected when assessed against signals available from other sensors or components within the control system.

Rationality failures include malfunctions that lead to the measured signal (i.e. voltages, currents, frequencies, etc.) being outside the range where the transfer function of the sensor is designed to operate.

3.3.2. Electrical circuit failure

"Electrical circuit failure" means a malfunction (e.g. open circuit or short circuit) that leads to the measured signal (i.e. voltages, currents, frequencies, etc.) being outside the range where the transfer function of the sensor is designed to operate.

3.3.3. Functionality failure

"Functionality failure" means a malfunction where an output component does not respond to a computer command in the expected way.

3.4. Alert system

"Alert system" means a system on-board the vehicle which provides the operator or any other interested party with information concerning the occurrence of any malfunction of the system monitored by the OBD system or of the OBD system itself.

3.5. Malfunction indicator

"Malfunction indicator (MI)" means a visual indicator which is part of the alert system and which clearly informs the driver of the vehicle in the event of a malfunction.

3.6. Qualified Deteriorated Component or System

"Qualified Deteriorated Component or system (QDC)" means a component or system that has been intentionally deteriorated and/or manipulated in a controlled manner and which has been accepted by the authorities according

to the provisions set in the applicable specific module as a qualified component for the purpose of demonstrating compliance with this gtr.³

³ Specific modules may not require the use of such components or systems in their demonstration process

4. GENERAL REQUIREMENTS

4.1. Monitoring requirements

All components and systems addressed by this GTR shall be monitored by the OBD system in accordance with the requirements of the specific modules.

4.2. Requirements for malfunction classification

Depending on the requirements of each specific module, a malfunction may be required to be classified according to its possible effects.

In that case, when the OBD system detects a malfunction, specific measures may be required, depending on the class of this malfunction.

Some of these measures may be part of the specific modules (e.g. the MI activation scheme). Some others may be part of national/regional road-worthiness regulations.

Such a classification is assessed by the manufacturer and its conformity is certified at the same time as the OBD system.

A malfunction is given one class for the actual life of the vehicle.

4.3. Alert system

The specific modules indicate the alert system to be used for specific functions.

The failure of the malfunction indicator(s) or of a component of the alert system shall not cause the rest of the OBD system to stop functioning.

4.3.1. Malfunction indicator

Vehicles addressed by this gtr shall be equipped with a malfunction indicator (MI) or malfunction indicators as required by the specific modules of this Regulation.

Schemes for activating/deactivating the MI are described in the specific modules

The malfunction indicator shall be visible, even by daylight; its satisfactory condition shall be easily verifiable by the driver from the driver's seat.

4.4. Diagnosis information

4.4.1. Recorded information

The information recorded by the OBD system shall be made available upon off-board request according to section 4.4.2 in packages that are defined in the specific modules.

Depending on the purpose of each specific module as described in part A of this GTR, the full data set recorded by the OBD system and/or module specific subsets may be required.

4.4.2. Access to OBD information

OBD data (as defined in the specific modules, for example data-stream information in the case a scanning tool is used, including all fault codes used), shall be produced only in accordance with the standards mentioned in section 9.1 of this module (annex 1), which, by virtue of the fact that their format and the permitted options are clearly defined, provide for a maximum level of harmonisation.

OBD data shall be provided by the OBD system upon request of an off-board test equipment that complies with the requirements of ISO standard - part 6 - compliance test (communication with external tester).

Access to OBD data shall not be dependent on an access code, or other device, obtainable only from the manufacturer or its suppliers nor shall it require for analysis any unique decoding information, unless that information is publicly available.

A single OBD access point/node for communication shall be supported to retrieve the OBD system status and/or the OBD information data as requested by the different modules of this gtr.

A 'master' data set shall be available through this single access point/node according to the specific modules of this gtr to provide data from any OBD system (e.g Emissions related OBD system, safety related OBD systems etc.).

This 'master' data set will be scalable to provide relevant data for the information packages defined in the specific modules of this gtr.

[Any OBD system on a single vehicle / engine shall use the same protocol for communicating OBD information from the single access point/node to off-board requests.

Only one baudrate shall be supported by the OBD system when the external test equipment communicates OBD system data as specified in ISO Road vehicles - On board diagnostics (WWH-OBD) implementation - Part 2 - Common emissions-related data dictionary.]

4.4.2.1. wired communication

[This section applies to the case a data communication based on a wired connection is required by any of the specific module of this GTR. A standard data link connector shall then be incorporated in the vehicle. In the case the OBD requirements concern only a sub-system of the complete vehicle, then the documentation for installing this system on the complete vehicle shall specify the required wired connection.

There shall be only one communication data link for OBD off-board communication.

The communication speed on the wired data link of the OBD system shall be either 250 kbps or 500 kbps. It is the manufacturer's responsibility to select the baudrate and to design the OBD system according to the requirements specified in the ISO standard (reference applicable part of the new ISO doc).

The OBD system shall be tolerant against an automatic baudrate detection algorithm exercised by the external test equipment as specified in (reference applicable part of the new ISO docs)]

The connection interface between the vehicle and the diagnostic tester shall be standardised and shall meet all the requirements of ISO 15031-3 Type A (12 VDC power supply), Type B (24 VDC power supply) or SAE J1939-13 (12 or 24 VDC power supply) (applicable information will move into new ISO document Part 4: Wired connection).

The diagnostic connector shall be located in a suitable position by the side of the driver's seat, including on the floor of the cabin. In this

case the connector should be accessible by a person outside the vehicle and not restrict access to the driver's seat. As an alternative, the diagnostic connector may also be located as specified in ISO Road vehicles - On board diagnostics (WWH-OBD) implementation - Part 4 - Wired connection (see also ISO standard 15031-3).

In all cases, the installation position shall be readily accessible by service personnel but protected from accidental damage during normal conditions of use.

If the connector is covered or located in a specific equipment box, the cover or the compartment door must be removable by hand without the use of any tools and be labelled "OBD" to aid technicians in identifying the location of the connector. Access to the diagnostic connector may not require the removal of any storage accessory (e.g., ashtray, coin box).

Manufacturers may equip vehicles with additional diagnostic connectors for manufacturer-specific purposes other than the required OBD functions. However, if the additional connector conforms to one of the diagnostic connectors allowed in this section, the connector(s) must be clearly labelled to identify which connector is used to access the standardized OBD information required in this section.

4.4.2.2. Additional On-Board visual display

In addition to providing OBD information through the standard diagnostic connector, the manufacturer may use an on-board diagnostic display, such as a dashboard mounted video display device, for enabling access to OBD information.

4.5. Durability of the OBD system

The OBD system shall continue to perform for the complete life of the vehicle/engine.

Detailed provisions addressing the durability of OBD systems are contained in the specific modules.

An OBD system shall not be programmed or otherwise designed to partially or totally deactivate based on age and/or mileage of the vehicle during the actual life of the vehicle, nor shall the system contain any algorithm or strategy designed to reduce the effectiveness of the OBD system over time.

5. Performance requirements

Detailed provisions concerning performance requirements of an OBD system are contained in the specific modules.

6. Demonstration requirements

Detailed provisions concerning the demonstration of an OBD system's conformity with the requirements of the applicable modules of this GTR are contained in the specific modules.

7. Test procedures

Where the demonstration of the compliance of an OBD system is based on an experimental process, the detailed provisions concerning the applicable test procedure(s) are contained in the specific modules.

8. Documentation requirements

The manufacturer shall provide a documentation package to the authority that includes a full description of the OBD system. This package may, depending on the requirements of each specific module, be separated into three parts:

- A primary documentation package, which shall be retained by the authority and may be made available to interested parties upon request.
- A secondary documentation package containing the pieces of information that will remain strictly confidential.
- A third documentation package containing the specific installation requirements for installing the vehicle sub-system (e.g. engine system) considered by a specific module.

The complete documentation package shall fully describe the functional characteristics of the OBD system as required in detail in the specific modules. This includes but is not limited to:

- The relationships between monitors, sensors and/or actuators
- The conditions enabling monitors to run and the disabling conditions that cause monitors not to run as specified in the specific modules. There may be enabling/disabling conditions given in the documentation that are applicable to several monitors.

9. Annexes

9.1. Reference Standard Documents:

The following International Organization of Standards (ISO) documents are incorporated by reference into this regulation:

- (i) ISO standard xxx dated dd.mm.yy Road vehicles - On board diagnostics (WWH-OBD) implementation -
Part 1 - General Information and use case definitions
- (ii) ISO standard xxx dated dd.mm.yy Road vehicles - On board diagnostics (WWH-OBD) implementation -
Part 2 - Common emissions-related data dictionary
- (iii) ISO standard xxx dated dd.mm.yy Road vehicles - On board diagnostics (WWH-OBD) implementation -
Part 3 - Common message dictionary
- (iv) ISO standard xxx dated dd.mm.yy Road vehicles - On board diagnostics (WWH-OBD) implementation -
Part 4 - Wired connection
- (v) ISO standard xxx dated dd.mm.yy Road vehicles - On board diagnostics (WWH-OBD) implementation -
Part 6 - Conformance test
- (vi) ISO standard 15031-3 dated dd.mm.yy

The following Society of Automotive Engineers (SAE) (ISO) documents are incorporated by reference into this regulation:

- (vii) SAE J2403 "Medium/Heavy-Duty E/E Systems Diagnosis Nomenclature,"
October 1998 (SAE J2403).
- (viii) SAE J1939-13 dated dd.mm.yy