

TECHNICAL REQUIREMENTS FOR THE CONVERSION
OF HEAVY-DUTY ON-ROAD VEHICLES and ENGINES

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UNITED NATIONS

TEXT OF REGULATION

1. CONTENT OF THE REGULATION

This Regulation prescribes requirements for converting engines and vehicles type-approved according to Regulations No.49, 67, or 110.

It contains a modular structure, where:

- (a) module A is a "generic" module containing specifications applicable to all types of engine and vehicle conversion
- (b) other modules are "specific" modules containing additional or supplementing requirements that are limited to specific conversion types.

2. RESPONSIBILITIES

2.1. This Regulation describes the responsibilities of the person or body in charge of an engine or vehicle conversion.

2.2. Responsibilities of the manufacturer of the engine or vehicle subject to conversion

2.2.1. From a regulatory stand-point, the responsibility of the original engine manufacturer regarding compliance to Regulation No.49 ceases as soon as the vehicle is converted.

2.2.2. From a regulatory stand-point, the responsibility of the original vehicle manufacturer regarding compliance to Regulations No. 49, 67 and 110, as appropriate, ceases as soon as the vehicle is converted.

2.2.3. In the case when the person or body in charge of the conversion ceases to exist, the original engine manufacturer shall not be considered as responsible in any manner of the non-compliance of a converted engine or vehicle regarding this Regulation and Regulations No. 49, 67, and 110, as appropriate

MODULE A

GENERIC CONVERSION PROVISIONS

1. PURPOSE

This module prescribes the general requirements for converting Heavy-Duty engines and vehicles type-approved to Regulation No.49 into Heavy-Duty engines and vehicles for which the original type-approval does not apply.

2. SCOPE

This module applies to engines and vehicles within the scope of Regulation No.49.

3. DEFINITIONS

3.1. Unless otherwise specified in this Regulation, the definitions set out in Regulation No.49 shall apply.

3.2. For the purpose of this Regulation, the following definitions shall apply

3.2.1. "Certification authority" or "Approval authority" means the authority that grants the compliance certification of a conversion system, of a converted vehicle, or of the installation of an engine system on a converted vehicle according to this Regulation.

3.2.2. "Type-Approval authority" means the authority that granted the original compliance of the converted vehicle or engine according to Regulation No.49.

3.2.3. "Engine conversion" means fitting new elements of design to an approved engine system and/or substantially changing its emission or operating strategies (for example in view of letting it run with a different fuel).

3.2.4. "Conversion system" means the complete set of elements of design permitting an engine conversion

3.2.5. "Vehicle conversion" means fitting new elements of design to an approved vehicle in view of enabling that vehicle to operate with an engine system it was not approved according to Regulations No.49, 67, and 110 to operate with.

3.2.6. "Converted engine system", or by extension in this Regulation "Engine system" means the engine system as defined in Regulation No.49, once converted.

3.2.7. "Convertible engine system" means an engine system type-approved according to Regulation No.49 that may be converted by means of a certified conversion system

3.2.8. "Converter" means the person or body who is responsible to the Certification Authority for all aspects of the conversion authorisation process and for ensuring conformity of the conversion. It is not essential that the person or body be directly involved in all stages of the conversion of the engine system or vehicle which is the subject of the approval process.

3.2.9. "Production" means all aspects of the actual conversion of the engine system or vehicle which is the subject of the approval process. It includes but is not limited to the manufacture of the elements of design of the conversion system, and to the installation of these elements on the engine or vehicle.

4. REQUIREMENTS FOR CERTIFYING A CONVERSION SYSTEM

4.1. Application for approval

4.2. Requirements for approval.

- Universal, fuel restricted, fuel specific approvals
- Approval marks and labelling
- ...

4.3. Documentation requirements

- documentation requirements for approval
- documentation requirements for installing the converted engine on a vehicle
- ...

4.4. General requirements

- Requirements to limit Off-cycle emissions
- Family concepts
- ...

4.5. Specifications concerning the emission of gaseous and particulate pollutants

- Emission limits
- Durability
- ...

4.6. Requirements regarding the diagnostic systems on board the engine

- On-board diagnostic system (OBD)
- Requirements to ensure correct operation of NOx control measures

4.7. Conformity of production

- Penalties for non-conformity of production

4.8. Conformity of in service vehicles/engines

4.9. Modification and extension of approval of the approved type

4.10. Conversion definitively discontinued

- 4.11. Specific requirements
- 4.11.1 Conversion of a diesel engine into a dual-fuel engine
- 4.11.1.1 In addition to the requirements laid out in this module, or in substitution to these requirements, specific requirements are prescribed in module B of this Regulation in the case when the conversion system aims at converting diesel engine systems into dual-fuel engine systems

- 5. REQUIREMENTS FOR CERTIFYING A CONVERTED VEHICLE
- 5.1. Application for approval
- 5.2. Requirements for approval.
 - Approval marks and labelling
 - ...
- 5.3. Documentation requirements
 - documentation requirements for approval
 - ...
- 5.4. General requirements
- 5.5. Requirements for converting a vehicle operated by a Diesel engine into a vehicle using a gaseous fuel.
 - conformity with R67 and R110
 - ...
- 5.6. Conformity of production
 - Penalties for non-conformity of production
- 5.7. Modification and extension of approval of the approved vehicle
- 5.8. Conversion definitively discontinued
- 5.9. Specific requirements
- 5.9.1 Conversion of a diesel vehicle into a dual-fuel vehicle
- 5.9.1.1 In addition to the requirements laid out in this module, or in substitution to these requirements, specific requirements are prescribed in module C of this Regulation in the case of conversion of diesel vehicles into dual-fuel ones.

- 6. REQUIREMENTS FOR INSTALLING A CERTIFIED ENGINE ON A CONVERTED VEHICLE
- 6.1. Application for approval

- 6.2. Requirements for approval.
- Universal, fuel restricted, fuel specific approvals
 - Approval marks and labelling
 - ...
- 6.3. Documentation requirements
- documentation requirements for approval
 - ...
- 6.4. General requirements
- compliance with the installation requirements of the certified engine
 - ...
- 6.5. Installation requirements and tests
- general installation requirements
 - Installation requirements and tests regarding the on-board diagnostic system (OBD)
 - Installation requirements and tests regarding the system to ensure correct operation of NO_x control measures
 - ...
- 6.6. Conformity of production
- Penalties for non-conformity of production
- 6.7. Modification and extension of approval of the approved type
- 6.8. Installation definitively discontinued
- 6.9. Specific requirements
- 6.9.1 Installation of a converted dual-fuel engine on a vehicle
- 6.9.1.1 In addition to the requirements laid out in this module, or in substitution to these requirements, specific requirements are prescribed in module C of this Regulation in the case when the conversion system aims at installing a converted dual-fuel engine on a vehicle

MODULE B

SPECIFIC PROVISIONS FOR CERTIFYING A CONVERSION SYSTEM AIMING AT CONVERTING DIESEL ENGINE SYSTEMS INTO DUAL-FUEL ENGINE SYSTEMS

1. PURPOSE

This module prescribes specific requirements for converting diesel engines type-approved according to revision 5 of Regulation No.49 into dual-fuel engines. These requirements complete or, when applicable, supersede those set out in module A of this Regulation.

2. SCOPE

2.1. This module solely applies to engines to be installed on vehicles within the scope of Regulation No.49.

2.2. This module solely applies to engines converted into a [list of allowed Type(s)...] dual-fuel engine

3. DEFINITIONS

For the purpose of this Module, the following definitions shall apply

3.1. "xxx" means

4. SPECIFIC REQUIREMENTS REGARDING THE CONVERSION SYSTEM USED FOR CONVERTING AN ENGINE SYSTEM COMPLIANT WITH REGULATION No49 REV.5

4.1. Requirements related to the Family concepts

4.2. Specifications and tests concerning the emission of gaseous and particulate pollutants

4.3. Durability requirements and tests

4.4. Requirements and tests regarding the on-board diagnostic system

4.5. Requirements to ensure correct operation of NOx control measures and tests

4.6. Requirements regarding operating modes

4.7. Requirements regarding the conformity of in service vehicles/engines

5. SPECIFIC REQUIREMENTS REGARDING THE CONVERSION SYSTEM USED FOR CONVERTING AN ENGINE SYSTEM COMPLIANT WITH REGULATION No49 REV.6

5.1. General requirements

5.1.1. The conversion, shall lead to an engine fully compliant with the requirements specified by Regulation No49 rev.6, whatever is the number of operating hours of the convertible engine system

5.2. Durability requirements

5.3. Demonstration and tests

5.3.1. The compliance demonstration shall be performed after conversion of a EURO VI engine not having been operated during more than [xxx] hours

5.3.2. All the tests required by Regulation No49 rev.6 for new engines shall be performed

MODULE C

ADDITIONAL PROVISIONS REQUIREMENTS FOR CERTIFYING A VEHICLE ORIGINALLY OPERATED BY A DIESEL ENGINE AND CONVERTED INTO A DUAL-FUEL VEHICLE AND FOR INSTALLING A DUAL-FUEL ENGINE ON THAT VEHICLE

1. PURPOSE

This module prescribes the general requirements for converting vehicles originally operated by a diesel engine and type-approved according to Regulation No.49 into a dual-fuel vehicle and for installing a dual-fuel engine on that vehicle

2. SCOPE

This module applies to engines and vehicles within the scope of Regulation No.49.

3. DEFINITIONS

For the purpose of this Regulation, the following definitions shall apply

3.1. "..." means ...

4. SPECIFIC REQUIREMENTS FOR CONVERTING A DIESEL VEHICLE INTO A DUAL FUEL VEHICLE

4.1. Approval marks and labelling

4.2. Documentation requirements

4.3. Requirements regarding the on-board diagnostic system

4.4. Requirements to ensure correct operation of NOx control measures

4.5. Requirements regarding the operating modes

5. REQUIREMENTS FOR INSTALLING A DUAL-FUEL ENGINE IN A CONVERTED DUAL-FUEL VEHICLE

5.1. Compliance with the installation requirements of the certified dual-fuel engine

5.2. Requirements regarding the on-board diagnostic system

5.3. Requirements to ensure correct operation of NOx control measures