**THE NETHERLANDS**
(N E D E R L A N D)

**EC TYPE-APPROVAL CERTIFICATE**

Communication concerning:

- ~~EC type-approval~~ (1)
- extension of EC type-approval (1)
- ~~refusal of EC type-approval~~ (1)
- ~~withdrawal of EC type-approval~~ (1)

of a type of a vehicle with regard to a system with regard to Regulation (EC) number 595/2009 as implemented by Regulation (EU) number 582/2011, as last amended by Commission Regulation (EU) number 2016/1718.

| | | |
|---|---|---|
| **EC type-approval number** | : | **e4*595/2009*2016/1718C*0085*01** |
| Reason for extension | : | See INFORMATION DOCUMENT page 2 |

**SECTION I**

| | | | |
|---|---|---|---|
| 0.1. | Make (trade name of manufacturer) | : | **SCANIA** |
| 0.2. | Type | : | LPGRS-series with<br>DC07 Eu VI Engine Family #2 |
| 0.2.1. | Commercial name(s) (if available) | : | --- |
| 0.3. | Means of identification of type, if marked on the vehicle (a) | : | See INFORMATION DOCUMENT:<br>Type and general commercial descriptions. |
| 0.3.1. | Location of that marking | : | See INFORMATION DOCUMENT:<br>Type and general commercial descriptions. |
| 0.4. | Category of vehicle (b) | : | N3, N3G |
| 0.5. | Name(s) and address(es) of manufacturer | : | SCANIA CV AB<br>SE-151 87 Södertälje<br>Sweden |
| 0.7. | Name(s) and address(es) of assembly plant(s) | : | See INFORMATION DOCUMENT:<br>Type and general commercial descriptions |

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*Vehicle Admission & Surveillance*

## SECTION II

| | | | |
|---|---|---|---|
| 1. | Additional information (where applicable) | : | see Addendum |
| 2. | Technical service responsible for carrying out the tests | : | RDW<br>P.O. Box 777<br>2700 AT Zoetermeer<br>The Netherlands |
| 3. | Date of test report | : | 12 April 2013<br>10 July 2015<br>30 December 2016<br>30 December 2016<br>30 December 2016<br>30 December 2016<br>30 December 2016<br>30 December 2016<br>30 December 2016<br>29 September 2017<br>29 September 2017<br>29 September 2017 |
| 4. | Number of test report | : | RDW-595/2009-0003901 (RMI)<br>RDW-595/2009-0034245 (IUPR)<br>RDW-595/2009-0050523 (Power DC07 113)<br>RDW-595/2009-0050524 (Emissions DC07 113)<br>RDW-595/2009-0050525 (PEMS N3)<br>RDW-595/2009-0050526 (OBD Family #2)<br>RDW-595/2009-0050527 (Power DC07 112)<br>RDW-595/2009-0050528 (Emissions DC07 112)<br>RDW-595/2009-0050529 (Power DC07 111)<br>RDW-595/2009-0050530 (Emissions DC07 111)<br>RDW-595/2009-0060477 (Power DC07 113-HVO)<br>RDW-595/2009-0060478 (Emissions DC07 113-HVO)<br>RDW-595/2009-0060479 (PEMS N3-HVO) |
| 5. | Remarks (if any) | : | INFORMATION DOCUMENT 66 pages |

| | | |
|---|---|---|
| 6. | Place | : Zoetermeer |
| 7. | Date | : 2 October 2017 |
| 8. | Signature | : |


Attachments:
- Information package.
- Test report.
- Addendum.

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(1) Delete where not applicable (there are cases where nothing needs to be deleted when more than one entry is applicable).
(a) If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered by this type-approval certificate such characters shall be represented in the documentation by the symbol: "?" (e.g. ABC??123??).
(b) Classified according to definitions listed in Section A of Annex II to Directive 2007/46/EC.

**ADDENDUM**

**to EC type-approval certificate number: e4*595/2009*2016/1718C*0085*01**

| | | | |
|---|---|---|---|
| 1. | Additional information | | |
| 1.1. | Particulars to be completed in relation to the type-approval of a vehicle with an engine installed: | | |
| 1.1.1. | Make of engine (name of undertaking) | : | SCANIA |
| 1.1.2. | Type and commercial description (mention any variants) | : | see type plate certificate e4*19/2011*249/2012*1158*xx |
| 1.1.3. | Manufacturer's code as marked on the engine | : | DC07 113, DC07 112 OR DC07 111 |
| 1.1.4. | Category of vehicle (if applicable) [(b)] | : | N3, N3G |
| 1.1.5. | Category of engine | : | Diesel/~~Petrol/LPG/NG-H/NG-L/NG-HL/ Ethanol (ED95)/Ethanol (E85)/LNG/LNG$_{20}$~~ [-(1)] |
| 1.1.5.1. | Type of dual-fuel engine | : | N.A |
| 1.1.6. | Name and address of manufacturer | : | SCANIA CV AB<br>SE-151 87 Södertälje<br>Sweden |
| 1.1.7. | Name and address of manufacturer's authorised representative (if any) | : | N.A. |
| 1.2. | If the engine referred to in 1.1 has been type-approved as a separate technical unit | : | N.A. |
| 1.2.1. | Type-approval number of the engine/ engine family [(1)] | : | N.A. |
| 1.2.2. | Engine Control Unit (ECU) software calibration number | : | N.A. |
| 1.3. | Particulars to be completed in relation to the type-approval of an engine/ engine family [(1)] as a separate technical unit (conditions to be respected in the installation of the engine on a vehicle): | | N.A. |
| 1.3.1. | Maximum and/or minimum intake depression | : | N.A. |
| 1.3.2. | Maximum allowable back pressure | : | N.A. |
| 1.3.3. | Exhaust system volume | : | N.A. |
| 1.3.4. | Restrictions of use (if any) | : | N.A. |

1.4. Emission levels of the ~~engine/~~parent engine [1]

Deterioration Factor (DF) : ~~calculated~~/fixed [1]

Specify the DF values and the emissions on the WHSC (if applicable) and WHTC tests in the table below

1.4.1. WHSC test

| WHSC test (if applicable) [10] [d5] | | | | | | | |
|---|---|---|---|---|---|---|---|
| DF Mult/~~add~~ [1] | CO | THC | NMHC [d4] | $NO_x$ | PM Mass | $NH_3$ | PM Number |
| | 1.3 | 1.3 | N.A. | 1.15 | 1.05 | 1.0 | 1.0 |
| Emissions | CO (mg/kWh) | THC (mg/kWh) | NMHC [d4] (mg/kWh) | $NO_x$ (mg/kWh) | PM Mass (mg/kWh) | $NH_3$ ppm | PM Number (#/kWh) |
| Limit values | 1500 | 130 | N.A. | 400 | 10 | 10 | 8 E+11 |
| Test result | 4.8 | 6.7 | N.A. | 265.8 | 4.2 | 0 | 1.77 E+11 |
| Calculated with DF | 6.3 | 8.7 | N.A. | 305.7 | 4.5 | 0 | 1.77 E+11 |
| $CO_2$ mass emission: 632 g/kWh<br>Fuel consumption: 203 g/kWh | | | | | | | |

WHSC test - HVO

| WHSC test (if applicable) [10] [d5] | | | | | | | |
|---|---|---|---|---|---|---|---|
| DF Mult/~~add~~ [1] | CO | THC | NMHC [d4] | $NO_x$ | PM Mass | $NH_3$ | PM Number |
| | 1.3 | 1.3 | N.A. | 1.15 | 1.05 | 1.0 | 1.0 |
| Emissions | CO (mg/kWh) | THC (mg/kWh) | NMHC [d4] (mg/kWh) | $NO_x$ (mg/kWh) | PM Mass (mg/kWh) | $NH_3$ ppm | PM Number (#/kWh) |
| Limit values | 1500 | 130 | N.A. | 400 | 10 | 10 | 8 E+11 |
| Test result | 6.4 | 3.1 | N.A. | 175.3 | 5.0 | 0 | 2.49 E+11 |
| Calculated with DF | 8.4 | 4.1 | N.A. | 201.6 | 5.3 | 0 | 2.49 E+11 |
| $CO_2$ mass emission: 618 g/kWh<br>Fuel consumption: 199 g/kWh | | | | | | | |

1.4.2. WHTC test

| WHTC test (10) (d5) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DF Mult/~~add~~ (1) | CO | THC | NMHC(d4) | CH4 (d4) | $NO_x$ | PM Mass | $NH_3$ | PM Number |
| | 1.3 | 1.3 | N.A. | N.A. | 1.15 | 1.05 | 1.0 | 1.0 |
| Emissions | CO (mg/kWh) | THC (mg/kWh) | NMHC(d4) (mg/kWh) | CH4 (d4) (mg/kWh) | $NO_x$ (mg/kWh) | PM Mass (mg/kWh) | $NH_3$ ppm | PM Number (#/kWh) |
| Limit values | 4000 | 160 | N.A. | N.A. | 460 | 10 | 10 | 6 E+11 |
| Cold start | 201.1 | 11.8 | N.A. | N.A. | 1195.2 | 5.0 | 0 | 3.17E+11 |
| Hot start without regeneration | 10.7 | 7.7 | N.A. | N.A. | 129.1 | 5.0 | 0 | 3.69E+11 |
| ~~Hot start with regeneration~~ (1) | N.A | N.A | N.A. | N.A. | N.A | N.A | N.A | N.A |
| ~~$k_{r,u}$ (mult/add)~~ (1)<br>~~$k_{r,d}$ (mult/add)~~ (1) | N.A | N.A | N.A. | N.A. | N.A | N.A | N.A | N.A |
| Weighted test result | 37.3 | 8.3 | N.A. | N.A. | 278.4 | 5.0 | 0 | 1.94E+11 |
| Final test result with DF | 48.5 | 10.9 | N.A. | N.A. | 320.1 | 5.3 | 0 | 1.94E+11 |
| $CO_2$ mass emission: 664 g/kWh<br>Fuel consumption: 214 g/kWh | | | | | | | | |

WHTC test - HVO

| WHTC test (10) (d5) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DF Mult/~~add~~ (1) | CO | THC | NMHC(d4) | CH4 (d4) | $NO_x$ | PM Mass | $NH_3$ | PM Number |
| | 1.3 | 1.3 | N.A. | N.A. | 1.15 | 1.05 | 1.0 | 1.0 |
| Emissions | CO (mg/kWh) | THC (mg/kWh) | NMHC(d4) (mg/kWh) | CH4 (d4) (mg/kWh) | $NO_x$ (mg/kWh) | PM Mass (mg/kWh) | $NH_3$ ppm | PM Number (#/kWh) |
| Limit values | 4000 | 160 | N.A. | N.A. | 460 | 10 | 10 | 6 E+11 |
| Cold start | 120.3 | 6.6 | N.A. | N.A. | 1051.8 | 6.1 | 0 | 2.75E+11 |
| Hot start without regeneration | 9.9 | 6.4 | N.A. | N.A. | 147.2 | 6.1 | 0 | 3.10E+11 |
| ~~Hot start with regeneration~~ (1) | N.A | N.A | N.A. | N.A. | N.A | N.A | N.A | N.A |
| ~~$k_{r,u}$ (mult/add)~~ (1)<br>~~$k_{r,d}$ (mult/add)~~ (1) | N.A | N.A | N.A. | N.A. | N.A | N.A | N.A | N.A |
| Weighted test result | 25.4 | 6.4 | N.A. | N.A. | 274.0 | 6.1 | 0 | 3.05E+11 |
| Final test result with DF | 33.0 | 8.3 | N.A. | N.A. | 315.0 | 6.4 | 0 | 3.05E+11 |
| $CO_2$ mass emission: 644 g/kWh<br>Fuel consumption: 210 g/kWh | | | | | | | | |

1.4.3. Idle test

| Idle test | | | | |
|---|---|---|---|---|
| Test | CO value (% vol) | Lambda (1) | Engine speed ($min^{-1}$) | Engine oil temperature (°C) |
| Low idle test | N.A | N.A | N.A | N.A |
| High idle test | N.A | N.A | N.A | N.A |

1.4.4. PEMS demonstration test

| PEMS demonstration test | | | | | | |
|---|---|---|---|---|---|---|
| Vehicle type (e.g. $M_3$, $N_3$ and application e.g. rigid or articulated truck, city bus) | N3, Rigid | | | | | |
| Vehicle description (e.g. vehicle model, prototype) | P280LB4X2MNA | | | | | |
| Pass-fail results (7) | CO | THC | NMHC | $CH_4$ | $NO_x$ | PM mass |
| Work window conformity factor | 0,15 | 0,027 | - | - | 0,52 | . |
| $CO_2$ mass window conformity factor | 0,15 | 0,029 | - | - | 0,55 | . |
| Trip information | Urban | | Rural | | Motorway | |
| Shares of time of the trip characterised by urban, rural and motorway operation as described in point 4.5 of Annex II to Regulation (EU) No 582/2011 | 22,2% | | 25,0% | | 52,8% | |
| Shares of time of the trip characterised by accelerating, decelerating, cruising and stop as described in point 4.5.5 of Annex II to Regulation (EU) No 582/2011 | Accelerating: 11.1 %<br>Decelerating: 9.1 %<br>Cruise: 79.1 %<br>Stop: 0.7 % | | | | | |
| | Minimum | | Maximum | | | |
| Work window average power (%) | 20,0 | | 45,3 | | | |
| $CO_2$ mass window duration (s) | 800 | | 1634 | | | |
| Work window: percentage of valid windows | 90.9 % | | | | | |
| $CO_2$ mass window: percentage of valid windows | 89.4 % | | | | | |
| Fuel consumption consistency ratio | 0.934 | | | | | |

PEMS demonstration test - HVO

| PEMS demonstration test | | | | | | |
|---|---|---|---|---|---|---|
| Vehicle type (e.g. $M_3$, $N_3$ and application e.g. rigid or articulated truck, city bus) | N3, Rigid | | | | | |
| Vehicle description (e.g. vehicle model, prototype) | P280LB4X2MNA | | | | | |
| Pass-fail results [7] | CO | THC | NMHC | $CH_4$ | $NO_x$ | PM mass |
| Work window conformity factor | 0,15 | 0,002 | - | - | 0,35 | . |
| $CO_2$ mass window conformity factor | 0,16 | 0,002 | - | - | 0,38 | . |
| Trip information | Urban | | Rural | | Motorway | |
| Shares of time of the trip characterised by urban, rural and motorway operation as described in point 4.5 of Annex II to Regulation (EU) No 582/2011 | 19,8% | | 23,5% | | 56,7% | |
| Shares of time of the trip characterised by accelerating, decelerating, cruising and stop as described in point 4.5.5 of Annex II to Regulation (EU) No 582/2011 | Accelerating: 9.8 %<br>Decelerating: 8.8 %<br>Cruise: 88.4 %<br>Stop: 1.3 % | | | | | |
| | Minimum | | Maximum | | | |
| Work window average power (%) | 20,0 | | 40,6 | | | |
| $CO_2$ mass window duration (s) | 865 | | 1634 | | | |
| Work window: percentage of valid windows | 94.4 % | | | | | |
| $CO_2$ mass window: percentage of valid windows | 91.8 % | | | | | |
| Fuel consumption consistency ratio | 0.974 | | | | | |

1.5. Power measurement

1.5.1. Engine power measured on test bench

| Engine power measured on test bench | | | | | | | |
|---|---|---|---|---|---|---|---|
| Engine Type | DC07 113 | DC07 112 | DC07 111 | | | | |
| Measured engine speed (rpm) | 1900 | 1900 | 1900 | | | | |
| Measured fuel flow (g/h) | 41262 | 36870 | 32688 | | | | |
| Measured torque (Nm) | 1022.1 | 921.1 | 818.2 | | | | |
| Measured power (kW) | 203.4 | 183.3 | 162.8 | | | | |
| Barometric pressure (kPa) | 100.3 | 100.8 | 100.7 | | | | |
| Water vapour pressure (kPa) | 1.70 | 1.68 | 1.72 | | | | |
| Intake air temperature (K) | 300 | 300 | 299 | | | | |
| Power correction factor | 1.004 | 1.002 | 1.002 | | | | |
| Corrected power (kW) | 204.2 | 183.6 | 163.1 | | | | |
| Auxiliary power (kW) (1) | --- | --- | --- | | | | |
| Net power (kW) | 204.2 | 183.6 | 163.1 | | | | |
| Net torque (Nm) | 1026 | 923 | 820 | | | | |
| Corrected specific fuel consumption (g/kWh) | 202 | 201 | 200 | | | | |

1.5.2. Additional data

...

RDW

(b) Classified according to definitions listed in Section A of Annex II to Directive 2007/46/EC.
(d1) In case of a dual-fuel engine or vehicle.
(d4) In the cases laid down in Table 1 of Annex 15 to UNECE Regulation No 49 for dual-fuel, and in Annex 1 to Regulation (EC) No 595/2009 for positive ignition engines.
(d5) In the case of dual-fuel engines of Type 1B, Type 2B and Type 3B, repeat the information in both dual-fuel and diesel mode.
(1) Delete where not applicable (there are cases where nothing needs to be deleted when more than one entry is applicable).
(7) Delete as appropriate.
(10) In the case of engines included in points 1.1.3. and 1.1.6. of Annex 1 to this Regulation, repeat the information for all fuels tested, where applicable.
(7) Delete as appropriate.
(10) In the case of engines included in points 1.1.3. and 1.1.6. of Annex 1 to this Regulation, repeat the information for all fuels tested, where applicable.

Category of vehicle: N3, N3G
Type: LPGRS series with DC07 Eu VI Engine Family #2
Issued by: sssmoi

**CONTENTS**

| Description | Reference | See page |
|---|---|---|
| Intercooler system cert dwg | 2515398 | 51 |
| Exhaust manifold, cert.dwg no. | 2515370 | 52 |
| Silencer including catalysts and Particulate filter, cert.dwg no. | 2015096 | 53 |
| Exhaust system, (part of) cert. dwg no. | 2361100 | 54-63 |
| Malfunction Indicator | --- | 64 |
| Vehicle diagnostic connector interface | --- | 64 |
| General design type, cert. dwg no. | 2354792, 1516677 | 65-66 |

**REASON FOR EXTENSION**

| Extension | Description | See page |
|---|---|---|
| --- | --- | --- |
| 01 | IUPR Test report reference corrected | Certificate: page 2 |
| | Addition of HVO as alternative fuel | Certificate: pages 5, 6 & 8.<br>Info doc: page 7 |
| | Addition of ECU:s | 9 |
| | Addition of 2:nd page for dwg 2359561 | 48 |

## INFORMATION DOCUMENT

According to Regulation (EU) No 595/2009, 582/2011, No 64/2012,133/2014, 136/2014, 627/2014 & 2016/1718

| | | Parent Engine or ~~Engine Type~~ | Engine Family Members | | | | |
|---|---|---|---|---|---|---|---|
| | **DC07** | **113** | **112** | **111** | | | |
| 0. | GENERAL | | | | | | |
| 0.I. | Make (trade name of manufacturer): | **SCANIA** | | | | | |
| 0.2. | Type | **LPGRS-series** | | | | | |
| 0.2.0. | ~~Engine type as separate technical unit / engine family as separate technical unit/vehicle with an approved engine with regard to emissions and access to vehicle repair and maintenance information /~~ vehicle with regard to emissions and access to vehicle repair and maintenance information (1) | | | | | | |
| 0.2.1. | Commercial name(s) (if available): | N.A | | | | | |
| 0.3. | Means of identification of type, if marked on the separate technical unit (b): | See Type and general commercial descriptions, pg 39-40 | | | | | |
| 0.3.1. | Location of that marking: | See Type and general commercial descriptions, pg 39-40 | | | | | |
| 0.5. | Name and address of manufacturer: | SCANIA CV AB<br>S-151 87 Södertälje Sweden | | | | | |

| | | |
|---|---|---|
| 0.7. | In the case of components and separate technical units, location and method of affixing of the EC approval mark: | N.A |
| 0.8. | Name(s) and address (es) of assembly plant(s): | See Type and general commercial descriptions, pg 39-40 |
| 0.9. | Name and address of the manufacturer's representative (if any): | N.A |

PART 1

**ESSENTIAL CHARACTERISTICS OF THE (PARENT) ENGINE AND THE ENGINE TYPES WITHIN AN ENGINE FAMILY**

| | | Parent Engine or ~~Engine Type~~ | Engine Family Members | |
|---|---|---|---|---|
| | **DC07** | **113** | **112** | **111** |
| 3.2 | **Internal combustion engine** | | | |
| 3.2.1. | *Specific engine information* | | | |
| 3.2.1.1. | Working principle:<br>Cycle: | ~~positive ignition~~ / compression ignition/~~dual-fuel~~ (1)<br>four stroke ~~/ two stroke / rotary~~ (1) | | |
| 3.2.1.1.1 | Type of dual-fuel engine: | ~~Type 1A/Type 1B/Type 2A/Type 2B/Type 3B~~ ([1])([d1]) | | |
| 3.2.1.1.2 | Gas Energy Ratio over the hot part of the WHTC test-cycle: %([d1]) | N.A | | |
| 3.2.1.2. | Number and arrangement of cylinders: | In-line 6 | | |
| 3.2.1.2.1. | Bore (l) mm | 107.0 | | |
| 3.2.1.2.2. | Stroke (l) mm | 124.0 | | |
| 3.2.1.2.3. | Firing order | 1-5-3-6-2-4 | | |
| 3.2.1.3. | Engine capacity (m) $cm^3$ | 6690 $cm^3$ | | |
| 3.2.1.4. | Volumetric compression ratio (2): | 17:1 | | |
| 3.2.1.5. | Drawings of combustion chamber, piston crown and, in the case of positive-ignition engines, piston rings | 2518928 | | |
| 3.2.1.6. | Normal engine idling speed (2) $min^{-1}$ | 600-700 | | |
| 3.2.1.6.1. | High engine idling speed (2) $min^{-1}$ | 2500±50 | | |
| 3.2.1.6.2 | Idle on Diesel: | N.A. | | |