DNV·GL

Certificate No:
TAA000011R

TYPE APPROVAL CERTIFICATE

This is to certify:

That the NOx Selective Catalytic Reduction Control System

with type designation(s)
SCR Aftertreatment for Caterpillar Marine Engine - Control Unit

Issued to
Caterpillar Inc.
Lafayette IN, United States

is found to comply with
DNV GL rules for classification – Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Temperature	**B**
Humidity	**B**
Vibration	**A**
EMC	**A**
Enclosure	**-**

Issued at **Hamburg** on **2017-04-07**
This Certificate is valid until **2019-09-02**.
DNV GL local station: **New York**

Approval Engineer: **Andrea Grün**

for **DNV GL**

Joannis Papanuskas
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Product description

SCR System Part Number Table

CEM Inlet Pressure Sensor	Part ID: 349-7375
Cabinet Temperature Sensor	Part ID: 256-6453
DEF Manifold Temperature Sensor	Part ID: 195-2150
SCR Dosing Reagent Pressure	Part ID: 298-6488
SCR 1 Intake Gas Temperature and SCR 1 Outlet Gas Temperature	Part ID: 373- 5283
Air Supply Pressure	Part ID: 320-3061
NOx Sensor 1500ppm 24V (Engine Out)	Part ID: 441-5127
NOx Sensor 1500ppm 24V (Outlet 1)-1	Part ID: 441-5128
DEF Tank Level and Temperature	Part ID: 456-4323
Aftertreatment ID	Part ID: 342-9070
A4E4 ECM Controller	Part ID: 417-6017
Software Version:	Part ID: 341-1317
Dosing Pump (C280)	Part ID: 397-5278
Dosing Pump (3500)	Part ID: 447-7102

Additional components:

Air Enable Valve	Part ID: 376-7736
Tank Fill Valve	Part ID: 376-7738
Reagent Return Solenoid Valve	Part ID: 376-7737

Application/Limitation

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)

The Type Approval covers software listed under Product description.

As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 [1.2.3] will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

Clause for application software control

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval.
Major changes in the software are to be approved before being installed in the computer.
A Certification of Application Functions may be required for the particular vessel.

Type Approval documentation

Tests carried out

Applicable tests according to Class Guideline DNVGL-CG-0339 November 2016.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines

- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE