DNV·GL

Certificate No:
TAA00000VR

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Governor Control System

with type designation(s)
Advanced Diesel Engine Management "ADEM V (A5E4v2)"

Issued to
Caterpillar Inc.
Lafayette IN, United States

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

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

Temperature	**D**
Humidity	**B**
Vibration	**B**
EMC	**B**
Enclosure	**C**

This Certificate is valid until **2022-04-26**.

Issued at **Hamburg** on **2017-04-27**
DNV GL local station: **New York** for **DNV GL**

Approval Engineer: **Andrea Grün**

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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Job Id:
Certificate No: **TAA00000VR**

Product description

Advanced Diesel Engine Management "ADEM V (A5E4v2)" is Fuel Injection Control and Speed Governing System, intended for reciprocating internal combustion engines produced by Caterpillar Inc.

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case.

Product certificate

Each delivery of the application system is to be certified according to the DNV GL Rules Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system, preferably at the engine/system application maker integrating control, monitoring and safety system, before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

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.

Test reports:

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