Certificate No:
TAA00002X9

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electronic fuel injection system

with type designation(s)
Advance Diesel Engine Management - ADEM VI (A6E4v3.1) for Caterpillar Engines Injection fuel system

Issued to
Caterpillar Inc.
Lafayette, IN, USA

is found to comply with
DNV 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.

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

Issued at **Hamburg** on **2022-05-17**
This Certificate is valid until **2027-05-16**.
DNV local station: **Certification & Inspection Services**

Approval Engineer: **Didier Girardin**

for **DNV**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

Advanced Diesel Engine Management "ADEM VI (A6E4v3.1) for fuel Injection Control and Speed Governing electronic Control Module for Caterpillar diesel series—Hardware: **X**_Model(name)_**Y**_ A6E4v3.1_**Z** [1)]

X – engine model designation (i.e. MAR – marine engines)
Y – engine model specific parameters (number of cylinders, etc.)
Z – number of cylinders (engine type) for 3500 series

1) Application software is not part of present type approval certificate.

Application/Limitation

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

Product certificate
As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 **will not** be required for system applications made and delivered by Caterpillar Inc. production facilities for DNV Type Approved diesel engines series. 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 for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

Clause for external production place(s)
Regular Audit to be performed confirming full CAT quality chain implemented at Manufacturing place(s) reflecting CAT quality control from equipment design to product release in the production.

- Supplier quality system governed by CAT quality system
- CAT design team and quality team control the design/production/testing quality, and final assembly and testing
- Software flashing and equipment testing is done at CAT workshop place

Manufacturing Place:

BorgWarner Mexico, S. de R.L. de C.V.
Avenida de los Encinos 1050
Parque Industrial Villa Florida
88718 Reynosa, Tamaulipas
Mexico

Marking of product

Maker, type designation, serial number.

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021

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

ANNEX

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