DNV·GL

Certificate No:
TAM000004N

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Diesel Engine

with type designation(s)
QSM11

Issued to
Cummins Inc.
COLUMBUS IN, United States

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

Application :

The approval is valid for propulsion, auxliary and emergency duty.

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Rating **see page 2**

This Certificate is valid until **2021-01-05**.

Issued at **Høvik** on **2016-01-06**

for **DNV GL**

DNV GL local station: **New York**

Approval Engineer: **Dag Harald Williksen**

Oddvar Deinboll
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: **262.1-002815-5**
Certificate No: **TAM000004N**

Product description

4-stroke diesel engine
Cylinder bore : 125 mm
Piston stroke : 147 mm
No. of cylinders : 6

Manufacturing plant: Cummins Engine Company, Lakewood, NY, USA.

Application/Limitation

The approval is valid for propulsion and auxiliary duty and based on the following main data (according to Cummins duty cycle):

Propulsion :

Mean eff. press, (bar):	21.64	17,7	15,7	16,1	13,6
Max. cyl. press, (bar):	175	152,9	141,6	130,5	115,6
Rated cont. output, (kW):	449	336	298	261	220
Corresponding to (RPM):	2300	2100	2100	1800	1800
Duty cycle	INT	MCD	HD	CON	CON

Auxiliary:

Mean eff. press, (bar):	19,5	16,3	19,5
Max. cyl. press, (bar):	151,6	132,1	136,8
Rated cont. output, (kw):	317	265	265
Corresponding to (RPM):	1800	1800	1500

Marking of product

Manufacturer's name or trademark. Type number designation.

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey every second year and before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued. The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

In cases where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

Other conditions

Torsional vibration calculations to be submitted for each installation according to the Rules Pt.4 Ch.2 Sec.2 "Torsional Vibrations".

Flexible hoses to be Type Approved by DNV GL.

Field instrumentation, including test facilities for sensors is not covered by this type approval and must be submitted for each installation according to the Rules Pt.4 Ch.9 Sec.5 - Control and Monitoring System.

Electric cables and cabling are not covered by this approval and must be verified to comply with the requirement of Rules Pt.4 Ch.8 - Electrical Installation.

The approval does not include driven member.

END OF CERTIFICATE