

Certificate No:

M-12529

File No:

723.10

Job Id:

262.1-008794-3**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Diesel Engine**with type designation(s)
D13, D13-700, D13-800, D13-900

Issued to

**AB Volvo Penta
GÖTEBORG, Sweden**

is found to comply with

**Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Rules for Classification of High Speed and Light Craft****Application :****The approval is valid for propulsion, auxiliary and emergency duty.****Rating see page 2**This Certificate is valid until **2018-06-11**.Issued at **Høvik** on **2014-06-11**DNV GL local station: **Gothenburg**Approval Engineer: **Jørgen Jensen Tande**for **DNV GL**Digitally Signed By: **Sollie, Tette**
Location: **DNV GL Høvik, Norway**
Signing Date: **08.07.2014** on behalf of**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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

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Product description

Four stroke diesel engine

Cylinder bore: 131 mm
Piston stroke: 158 mm
No. of cylinders: 6 in-line

Application/Limitation

The approval is valid for propulsion, auxiliary and emergency duty and is based on the following main data:

Propulsion:

Volvo Rating Group	R1	R2	R3		R4	R5
Mean indicated pressure (bar):	21.6	24.3	24.5	24.3	27.6	30.7
Max. cylinder pressure (bar):	160	165	170	193	190	200
Rated power (kW):	368	441	515	515	588	662
Corresponding to (RPM):	1800	1900	2250	2300	2300	2300

Auxiliary & Emergency:

	Auxiliary		Emergency	
Mean indicated pressure (bar):	24.5	23.3	24.5	23.3
Max. cylinder pressure (bar):	176	170	176	170
Rated power (kW):	360	400	349	381
Corresponding to (RPM):	1500	1800	1500	1800

Type Approval documentation

For R3, R4 and R5, crankshaft drawing 2126430, 20486231 and marked drawings in Volvo Penta Document List CL0741.

For R1, R2 and the emergency/auxiliary engines, crankshaft drawing 20486231 and drawings/documentation in Volvo Penta Document List CL0871.

Tests carried out

For R3, R4 and R5, type test report 128812-1 dated 2010-02-18.

For R1, R2 and the emergency/auxiliary engines, type test report 173515 dated 2011-07-06.

Marking of product

The product is to be marked with the manufacturer's name or trademark and type number identification.

Periodical assessment

For retention of the Type Approval, a DNV 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

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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.

Other conditions

Foundation arrangement to be submitted for each installation according to the Rules, Pt. 4 Ch.3 Sec.1 A500 – Documentation of arrangement.

Torsional vibration calculations to be submitted for each installation according to the Rules Pt.4, Ch.1, Sec. 1 G. Vibration.

Signboards according to the Rules Pt.4, Ch.3, Sec.1, C 406

Flexible hoses with couplings to be type approved by DNV.

Engine safety, control and monitoring systems, including sensors and actuators are not covered by this type approval certificate. Documentation for engine safety, control including speed governing and monitoring systems shall be submitted for approval according to Pt.4 Ch.9 Sec.1 Table C2 and/or as listed in relevant type approval certificates.

Electric cables and cabling are not covered by this approval and must be verified to comply with the requirement of DNV Rules for Ships/ High, Speed Light Craft and Naval Surface Craft Pt.4 Ch.8 - Electrical Installation.

The approval does not include driven member.

END OF CERTIFICATE