



MARINE DIVISION

Certificate number: 16924/B1 BV

File number: MOT 99/40

Product code: 0210I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

www.veristar.com

TYPE APPROVAL CERTIFICATE

This certificate is issued to

AB VOLVO PENTA

Göteborg - SWEDEN

for the type of product

INTERNAL COMBUSTION ENGINES

D 16

Requirements:

BUREAU VERITAS Rules for the Classification of Steel Ships.

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 26 Apr 2016**For BUREAU VERITAS,**

At BV GOTHENBURG, on 03 Apr 2013,

Magne MOLLER



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION:

D 16

6 Cylinders in Line
4-stroke direct injected, turbocharged and aftercooled diesel engine
Bore X Stroke: 144 X 165 mm.

Identification of engine, engine denomination, approved rating, and applications are the following:

MOT N° Engine Name	Application	Rating	Observation
MOT 99/40/1 D16	Propulsion	478 kW at 1800 rpm	Rating 1
		551 kW at 1900 rpm	Rating 2
	Auxiliary	450 kW at 1500 rpm	50 Hz
		500 kW at 1800 rpm	60 Hz
	Emergency	221 kW at 1500 rpm	one step load
		241 kW at 1800 rpm	
		442 kW at 1500 rpm	two steps
		499 kW at 1800 rpm	load

2. DOCUMENTS AND DRAWINGS:

- Crankshaft drawing N° 20463959 (2 Sheets).
- The following equipments are covered by this Certificate:

Oil cooler	drawing n°	20700518
Charge air cooler		3841478
Turbo charger		3809940
Vibration damper		3830110

3. TEST REPORTS:

Type Test performed at Volvo Penta Gothenburg Laboratory (Sweden) on engine n° 1219 on February 1st to February 8th 2006 for propulsion application at 1900 rpm and February 22nd for Genset tests.

4. APPLICATION / LIMITATION:

4.1 - Other materials and/or components:

This Certificate applies to bare engines. If required by the Rules, each attached piece of equipment is to be either type-approved or design-appraised on a case-by-case basis. The equipment listed in 2 above does not need to be resubmitted for approval.

4.2 - Application / Limitation of use:

- Diesel engines intended for propulsion of ships and genset prime mover application.
- For Emergency genset application the one step load is 221 kW (mec) for 1500 rpm and 241 kW (mec) for 1800 rpm.
- For Emergency genset application the two steps load is 442 kW (mec) for 1500 rpm and 499 kW (mec) for 1800 rpm.
- Maximum inclination angles:

Fore and aft	Static: 10°	Dynamic: 10°
Athwartship	Static: 30°	Dynamic: 22,5°
- These engines are not allowed when duplication of oil pump or fresh water pump is required.
- This engine may be fitted on ships granted with an automation notation provided that all the requirements stated in our Rules are complied with.
- The oil sump could be aluminium alloy material. The oil filter cartridge holder could be aluminium alloy material where steel encapsulated.

4.3 - On board installation & Maintenance requirements:

- The engine shall be equipped with the parts listed in the manufacturer's Parts Catalog exclusively.
- The engine will be delivered with the relevant documentation for their maintenance and their operation.
- The initial survey made at the factory does not prejudice of any additional test or survey which may be required for some specific applications, in order to comply with the related Rules of the Society.

5. PRODUCTION SURVEY REQUIREMENTS:

5.1 - The above product is to be manufactured, examined and tested by **AB VOLVO PENTA, S - 405 08 Göteborg - SWEDEN** in accordance with the type described in this certificate and Bureau Veritas Rules for the Classification of Steel Ships.

5.2 - Arrangements shall be made for a Society's Surveyor to attend the relevant tests and examinations at manufacturer's works or to perform the relevant audits when an alternative survey scheme (BV Mode I) has been agreed. Relevant Bureau Veritas certificate will be issued after satisfactory completion of the procedure.

5.3 - Tests and trials as per the requirements of Part C, Chap. 1, Sec. 2 of BUREAU VERITAS Rules for the Classification of Steel Ships, must be conducted.

5.4 - If required by the Rules, each attached piece of equipment is to be individually inspected at workshops by Society Surveyors (See NR 266 DT R02 E).

5.5 - The engine must be tested with all its final equipment accessories.

5.6 - The inspection made at the manufacturer's premises does not prejudice of any additional equipment which may be required for some specific applications, in order to comply with the related Rules of the Society.

6. MARKING OF PRODUCT:

- Serial number.
- Rated power and speed.
- Application.
- Date of workshop trial.
- Bureau Veritas' Marks.

7. OTHERS:

7.1 - It is understood that the herewith mentioned manufacturer will give the shipyards and related subcontractors all the relevant information for the proper fitting and uses of the product covered in this Type Approval Certificate. This information has to include the conditions stated in the Certificate.

It is also understood that Bureau Veritas remains rightfully entitled to perform any check or test on the product at any time.

7.2 - Where subcontracting takes place, the manufacturer remains entirely and solely responsible for compliance of the supplied products with the applicable requirements.

7.3 - This Certificate supersedes the Type Approval Certificate 16924/B0 BV issued on 26 April 2011 by the Society.

***** END OF CERTIFICATE *****