



Type Approval Certificate

Germanischer Lloyd

Certificate No. 25482-05 HH

Page 1 of 3

This is to certify that the Diesel Engine noted hereunder has been approved in accordance with the relevant requirements of the GL Approval System

Engine Manufacturer **AB Volvo Penta**
 405 08 Göteborg, Sweden

Engine Series / Type **D9**

Design / Working Process **In-line engine, trunk-pliston type, four stroke, single acting**

Combustion Method /
Kind of Air Charging **direct injection , exhaust turbo charging with aftercooler**

Technical Data

Rated Power [kW/Cylinder]	43,5	43,5	41,2	46,3
Rated Speed [1/min]	1800	2200	1500	1800
Mean effective Pressure [bar]	18,6	15,2	21,1	19,8
Max. Firing Pressure [bar]	178	181	178	180
Application	Unr.	Prop.	Aux.	Aux.

Approval Standard **Rules for Classification and Construction, Ship Technology, Part 1, Chapter 2, Section 2.E Tests and Trials**

Approval Documents **04-075193, 04-093363, 05-011636, 05-028457, 05-038457, 05-070560, 05-094629**

Hamburg, 2005-12-15

Germanischer Lloyd

H. J. Goetze *R. Michael*

H.-J. Goetze R. Michael

Notice: This Certificate is subject to remarks and details overleaf. Any significant change in design, up-fit or construction may render this Certificate invalid.

The latest edition of the General Terms and Conditions of Germanischer Lloyd is applicable. German law applies.



Germanischer Lloyd

Certificate No. 25482-05 HH

Page 3 of 3

Technical Data of engine tested:

No. of cylinders	6
Compression ratio	17,4:1
Exhaust gas turbocharger	KKK K31 3808049
Injection pump	Delphi 889489, 3165101
Injector	HBX 6967173
Governor	VOLVO EMS2
Actuator	Delphi 889489, 3165101
Engine safety and monitoring system	Engine Control and Monitoring System for D9
Starter	-

Remarks

1. The type approval is valid for application of these engines as auxiliary engines or as main propulsion engines for multiple engine plants on board ships with Germanischer Lloyd class. For application as a single main engine on board ships with Germanischer Lloyd class a separate individual approval by the society is required.
2. The EMS II Electronic Control Module is type approved with Certificate 20053-04 HH.
3. Local instrumentation equipment (lubricating oil pressure, fuel pressure, cylinder cooling water pressure, cooling water temperature, engine speed) is to be fitted according to the application of engine (refer to IACS M35/M36, GL Regulation 1-1-2/2-J-1)
4. All connections of pipes carrying lubrication oil or fuel oil have to be shielded in accordance with SOLAS requirements.
5. All hoses and hose assemblies are approved in accordance with ISO 15540/15541.
6. The engine is fitted with a duplex lubricating 11127824 and fuel filter 3808700.01 acc. to the application of the engine.
7. The engine has to be operated and serviced in straight accordance to the relevant manufacturer's operating and maintenance and fluid recommendations.

Hamburg, 2005-12-15

Germanischer Lloyd


H.-J. Goetze


R. Michael



Germanischer Lloyd

Certificate No. 25482-05 HH

Page 2 of 3

Technical Data (cont'd)

Number of cylinders	6
Cylinder bore [mm]	120
Stroke [mm]	138
Test Program Ref. No.	04-082068
Test Program Approval Date	2004-06-29
Fuel used for Test	Marine Distillate DMX ISO 8217
Serial No. of Engine tested	13625
Place of Test	Gothenburg, Sweden
Date of Test	2004-06-28 until 2004-07-04
Test Report	Test Report from D9R4 type approval, 66617-1.4
Test Report Ref. No.	04-093363
Date of Test Report	2004-07-16

Hamburg, 2005-12-15

Germanischer Lloyd

H.-J. Goetze

R. Michael