



CERTIFICATE NUMBER

DATE

14-LD178136-2-PDA

16 April 2014

ABS TECHNICAL OFFICE

London Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of
AB VOLVO PENTA - S-405 08 GOTEBORG

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

PRODUCT: **Diesel Engine**

MODEL: **D16**

This Product Design Assessment (PDA) Certificate 14-LD178136-2-PDA, dated 16/Apr/2014 remains valid until 15/Apr/2019 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING

Serkan Balakan
Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This application/certificate is governed by the "Terms and Conditions of the Request for Product Type Approval and Agreement" as contained in the ABS Rules.



Attachment to Product Design Assessment Certificate No: 14-LD178136-2-PDA

Propulsion

| D16 | | | | |
|-------------|------------|----------|---------------------------|-------------------------------|
| Speed (rpm) | Power (kW) | Ratings | Max Firing Press. (Bar.g) | Mean Indicated Press. (Bar.g) |
| 1800 | 478 | Rating 1 | 165 | 23.2 |
| 1900 | 551 | Rating 2 | 177 | 25.4 |

Auxiliary/Emergency

| Speed (rpm) | Power (kW) | Max Firing Press. (Bar.g) | Mean Indicated Press. (Bar.g) |
|-------------|------------|---------------------------|-------------------------------|
| 1500 | 450 | 169 | 26.2 |
| 1800 | 500 | 176 | 24.4 |

Crankshaft Details

| Engine Type | Material | Min. Tensile Strength, N/mm ² | Manufacturing Method | Max. Torsional Vibration Stress, N/mm ² |
|-------------|------------|---|----------------------|--|
| D16 | V -1649-01 | 600 (Unhardened) 1590 (Induction hardened) | Drop Forged | 81.5 |

MARINE COMMERCIAL RATINGS:

RATING 1 (Heavy Duty Commercial)

This power rating is intended for commercial vessels with displacement hulls in heavy operation, unlimited number of running hours per year. Engine running hours per year shall be unlimited. Load and speed could be constant and full power; can be used without interruption in applications such as coastal fishing boats.

RATING 2 (Medium Duty Commercial)

This power rating is intended for commercial vessels with semi planing or displacement hulls in cyclical operation, running hours less than 3000 hours per year. Engine running hours per year shall be less than 3000 hours per year. Full power could be utilized maximum 4 hours per every 12 hour operation period. Between full load operation periods, engine speed should be reduced at least 10 % from the obtained full load engine speed. Applications such as patrol and pilot boats, coastal fishing boats in cyclical operation (gill-netters, purse seiners, light trawlers), passenger boats and coastal freighters with short trips.

NOTE

Technical data is according to ISO 3046/1 and ISO 8665. All data present net performance with standard accessories under the conditions of 100 kPa barometric pressure, 25 °C ambient temperatures and 30% relative humidity.



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