Rolls-Royce

BETTER POWER FOR A CHANGING WORLD

MARINE
Bergen Engines

Engines & Foundry

- 850 employees
- 7000 engines sold
- 4 000 in operation
- 700 gas engines
- 61 marine gas engines
- Diesel engines since 1943
- Gas engines since 1991
- More than 25 million running hours on LNG

Rolls-Royce data - strictly private
Fjordline
Main features of the B36:45 platform:

Reduced Lifecycle Cost
1. Increased efficiency
2. Increased service intervals
3. Improved service friendliness

Increased Power
600 kW/cyl for gas and diesel engines

Reduced Fuel Consumption
L6 Marine: 7300 kJ/kWh*
L6 Land: 7290 kJ/kWh**

Incr. Power Flexibility
L6, L7, L8, L9, V12, V16, V20

Vibration
10-11 mm/s at main structure engine block

Market Launch
L6/L9: 2018
L8: 2019

Emission strategy
IMO Tier III compliant
Reduced methane slip

Human Machine Interface (HMI)
Dynamic Service Intervals

*For propulsion engine at 750 rpm, MN 70, no engine driven pumps, with a tolerance of +5 %
** For land engine at 750 rpm, MN 80, with engine driven pumps, ISO tolerance of +5%
Direct Propulsion
Generating set
**B36:45 Main Design Data - Gas fuel**

All data subject to change without notice

- **Bore x stroke:** 360 x 450 mm
- **Cyl. Volume:** 45.8 L/cyl.
- **Speed range:** 720/750 rpm generator law
  
  450 – 750 rpm propeller law
- **Mean piston speed:** 11.25 m/s
- **Cyl. Power Output:** 600 kW at 750 rpm
- **Break mean effective pressure:** 21 bar at 750 rpm
- **Firing pressure, max:** 200 bar, max
- **Charge air pressure:** 4.2 bar (abs) max (estimated)
- **Specific air consumption:** 5.2 kg/kWh at 100% load (est.)
- **ISO Energy**
  - **Marine:** 7300 kJ/kWh at 100% load
  - **Land:** 7290 kJ/kWh at 100% load

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B36:45 Engine Modules

- Fuel System
- Automation & Control

Identical to B33:45 Diesel
Similar to B33:45 Diesel
New, but based on B33:45
Safety (inherently safe)

- Double walled Gas Supply pipes from LNG tank to combustion chamber
- Gas detection in outer pipe system (ventilated 30 times per hour)
- “Block and bleed” valves stops all gas supply to the engine, if unexpected stop occurs
- Gas detection system above the engine according to class requirement.
HMI - Remote monitoring

- Data presented from an on-site server
- Display rendered for desktop, notebook, PDA and cell phone
- Future extensions:
  - Ordering of spare parts and service
  - Diagnosis and decision support