



# X6170ZC680-3 Marine propulsion engine



## Basic engine specifications

Rating .....	P1
Rated power-kW .....	500
Rated speed-rpm .....	1350
Overload power-kW .....	/
Overload speed-rpm .....	/
Rated power tolerance-% .....	2
Low idle speed -rpm .....	550
High idle speed-rpm .....	1458
N° of Cylinders / Valves .....	6/24
Cylinders arrangement .....	In-line
Thermodynamic cycle .....	4 stroke
Bore × Stroke-mm(in) .....	170×200 (6.69×7.87)
Compression ratio .....	15.1
Displacement-L(in <sup>3</sup> ) .....	27.24 (1662.3)
Fuel system .....	Mechanical
Injection system .....	Direct injection
Aspiration .....	Turbocharged and aftercooled
Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(standard) .....	SAE 0/18°/171
Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(optional) .....	SAE 0/16°/171
Firing order .....	1-5-3-6-2-4
Rotation(from flywheel end) .....	Counterclockwise
Overall dimensions(L×W×H)-mm(in) .....	2463×1200×1650 (97.0×47.2×65.0)
Dry weight-kg(lb) .....	3100 (6834)
Wet weight-kg(lb) .....	3239 (7141)
Max. output power of front end-kW(Ps) .....	500 (670)
Emission compliance .....	IMO Tier II
Lifting cylinder height- m(ft) .....	1.4 (4.59)

## Rating definitions

### Continuous Duty (P1)

The engine can run at full load continuously. The average load factor is 70% to 100%. Annual working time is recommended but not limited to 5000h~8000h.

### Heavy Duty (P2)

The engine can run at full load for 8h every 12h. The average load factor is 40% to 80%. Annual working time is recommended but not limited to 5000h.

### Intermittent Duty (P3)

The engine can run at full load for 4h every 12h. The average load factor is 40% to 80%. Annual working time is recommended but not limited to 3000h.

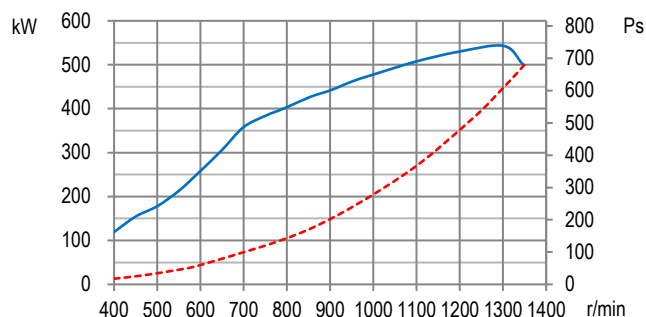
### Light Duty (P4)

The engine can run at full load for 2h every 8h. The average load factor is about 60%. Annual working time is recommended but not limited to 1000h.

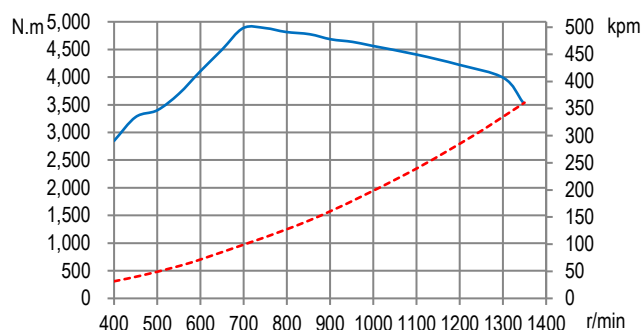
### High Performance Duty (P5)

The engine can run at full load for 0.5h every 5h. The average load factor is about 60%. Annual working time is recommended but not limited to 500h.

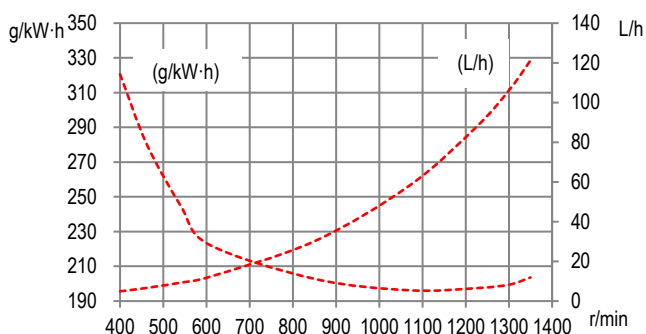
## Power



## Torque

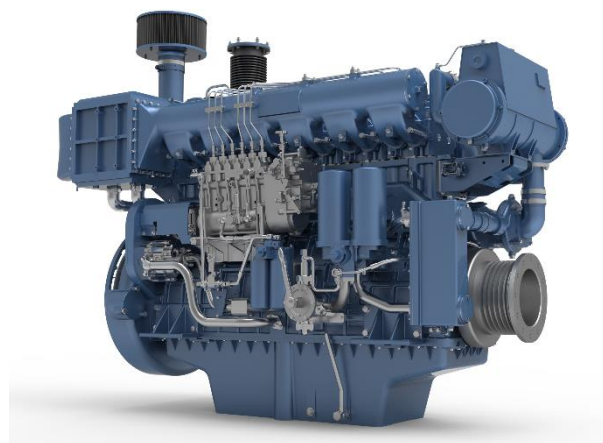


## Fuel consumption



— Full load speed characteristics

- - - Propeller characteristics





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## Air intake system

Intake air flow-m <sup>3</sup> /min(cfm)	41.7 (1490.6)
Max. allowable intake air restriction- kPa(in H <sub>2</sub> O)	6 (24.1)
Intake air temperature up to-°C(°F)	55 (131)
Heat rejection to atmosphere-kW(BTU/min)	60(3412.2)

## Cooling system

Coolant capacity of the engine-L(gal)	85(18.7)
Max. sea water strainer mesh hole diameter- mm(in)	2 (0.08)
Sea water pump flow-m <sup>3</sup> /h(gal/h)	30 (6600)
Head of sea water pump -m(ft)	25(82)
Max. self-priming height of sea water pump- m(ft)	0(0)
Expansion tank pressure cap- kPa(psi)	50(7.3)
Heat dissipating to heat exchanger- kW(BTU/min)	188(10691.6)
Coolant flow-m <sup>3</sup> /h(gal/h)	25.02(5504)
Temperature range of engine outlet -°C(°F)	≤80(≤176)
Temperature range of thermostat-°C(°F)	69-80(156.2-176)

## Exhaust system

Exhaust flow-m <sup>3</sup> /min(cfm)	115.2 (4115.67)
Max. exhaust back pressure-kPa(in H <sub>2</sub> O)	6 (24.10)
Max. exhaust temperature before turbocharger-°C(°F)	640 (1184)
Max. exhaust temperature after turbocharger-°C(°F)	500(932)
Max. bending moment of turbocharger flange- N·m(ft·lbs)	10(7.38)
Exhaust smoke-FSN	≤2.33

## Lubricating system

Max. install angle(fore-aft)	5°
Max. install angle(athwart ship)	15°
Max. operating angle(fore-aft)	7.5°
Max. operating angle(athwart ship)	22.5°
Sump type	Wet
Oil capacity Low/High-L(gal)	43/55 (9.5/12.1)
Oil consumption -g/(kW·h)	≤0.5
Oil flow- L/min(gal/min)	213.3 (46.926)
Oil pressure of idle speed- kPa(in H <sub>2</sub> O)	≥200(≥803)
Oil pressure of rated speed- kPa(in H <sub>2</sub> O)	400-500(1606-2008)

## Fuel system

Fuel flow supply line- L/h(gal/h)	136.2 (30.0)
Fuel flow return line- L/h(gal/h)	/ (/)
Max. Allowable fuel supply restriction -kPa(in H <sub>2</sub> O)	13 (52.2)
Fuel supply restriction on engine-kPa(in H <sub>2</sub> O)	0 (0)
Allowable fuel restriction of shipyard supplied components-kPa(in H <sub>2</sub> O)	13 (52.2)
Max. fuel return restriction-kPa(in H <sub>2</sub> O)	15 (60.2)
Max. self-priming height of fuel delivery pump-m(ft)	1 (3.28)
Max. fuel inlet temperature-°C(°F)	45 (113)
Max. fuel inlet pressure- kPa(in H <sub>2</sub> O)	/(/)

## Starting system

Electrical system voltage(2-pole)-V	24
Electric starter power-kW(Ps)	11 (15)
Recommended battery capacity- A·h	200×2
Alternator working current-A	80

## Security parameters

Alarm speed-rpm	1552
Shut down speed-rpm	1620
Alarm oil pressure-MPa	0.15
Shut down oil pressure-MPa	0.1
Alarm oil temperature-°C(°F)	90(194)
Alarm coolant temperature-°C(°F)	85(185)

## Noise

Noise(SPL)- dB(A)	118.8
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## General remarks

- The origin of coordinates is at the center of the flywheel housing back end surface. X axis directs from flywheel to front, Z axis directs vertical up, Y axis direction is defined by right-hand rule.
- All ratings are based on operating conditions under ISO 8665, ISO 3046-1.
- Curves represent net engine performance in accordance with ISO 3046/1 with standard accessories such as fuel injection pump, water pump and L.O. pump under the condition of 25°C/77°F ambient temperature, 100kPa[29.612 in Hg] barometric pressure, 30% relative humidity and 25°C/77°F raw water temperature at inlet.

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Materials and specifications are subject to change without notice.