

General

In-line four stroke diesel engine with direct injection.

| | | |
|---|---------------------------|----------------|
| Number of cylinders | | 4 |
| No of valves | | 2 |
| Displacement, total | litres in ³ | 4,76 290,7 |
| Firing order | | 1-3-4-2 |
| Rotational direction, viewed towards flywheel | | Anti-clockwise |
| Bore | mm in | 108 4,25 |
| Stroke | mm in | 130 5,12 |
| Compression ratio | | 17,6 |
| Compression pressure at 240 rpm | MPa | |
| Idling speed | rpm | 775 ± 25 |
| Rated speed | rpm | 2300 |
| Propeller selection range | rpm | 2275-2325 |

| Performance | Rating | r/min | 1000 | 1200 | 1500 | 1800 | 1900 | 2100 | 2300 | | | |
|--|---------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|--|--|
| Crankshaft power 1), 5) | 1 | kW | 45 | 57 | 77 | 86 | 89 | 96 | 102 | | | |
| | | hp | 61 | 78 | 105 | 117 | 121 | 131 | 139 | | | |
| Propellershaft power 1) (At full load) | 1 | kW | 44 | 55 | 75 | 83 | 86 | 93 | 99 | | | |
| | | hp | 59 | 75 | 102 | 113 | 117 | 127 | 135 | | | |
| Propellershaft power at prop.load x ^{2,5} | 1 | kW | 12 | 19 | 34 | 54 | 61 | 79 | 99 | | | |
| | | hp | 16 | 26 | 46 | 73 | 83 | 107 | 135 | | | |
| Propellershaft power at prop.load x ³ | 1 | kW | 8 | 14 | 27 | 47 | 56 | 75 | 99 | | | |
| | | hp | 11 | 19 | 37 | 64 | 76 | 102 | 135 | | | |
| Torque at crankshaft 2) | 1 | Nm | 430 | 454 | 490 | 456 | 447 | 437 | 423 | | | |
| | | lbf ft | 317 | 335 | 362 | 337 | 330 | 322 | 312 | | | |
| Mean piston speed | | m/s | 4,3 | 5,2 | 6,5 | 7,8 | 8,2 | 9,1 | 10,0 | | | |
| | | ft/s | 14,2 | 17,1 | 21,3 | 25,6 | 27,0 | 29,9 | 32,7 | | | |
| Effective mean pressure 2) | 1 | MPa | 1,13 | 1,20 | 1,29 | 1,20 | 1,18 | 1,15 | 1,12 | | | |
| | | psi | 164,4 | 173,5 | 187,6 | 174,6 | 171,1 | 167,0 | 162,0 | | | |

1) ISO 3046, fuel temp 40°C.

ISO 8665 (=SAE J 1228=ICOMIA 28-83)

2) At power according to 1).

3) If reverse gear is used, 4% in heat rejection will be added for its oil cooler.

4) Acc. to ISO 3744

5) At installed back pressure

| Fuel system | Rating | r/min | 1000 | 1200 | 1500 | 1800 | 1900 | 2100 | 2300 | | | |
|---|--------|----------|------|------|------|------|------|------|------|------|--|--|
| Specific fuel consumption 2) | 1 | g/kWh | 224 | 215 | 205 | 202 | 203 | 206 | 214 | | | |
| | | lb/hph | 0,36 | 0,35 | 0,33 | 0,33 | 0,33 | 0,33 | 0,33 | 0,35 | | |
| Fuel consumption at prop. load x ^{2,5} | 1 | l/h | 3 | 5 | 8 | 13 | 15 | 19 | 25 | | | |
| | | US gal/h | 0,8 | 1,3 | 2,2 | 3,4 | 3,9 | 5,1 | 6,7 | | | |
| Fuel consumption at prop. load x ³ | 1 | l/h | 2 | 4 | 7 | 11 | 14 | 18 | 25 | | | |
| | | US gal/h | 0,6 | 0,9 | 1,7 | 3,0 | 3,6 | 4,9 | 6,7 | | | |
| Fuel consumption at full load | 1 | l/h | 12 | 15 | 19 | 21 | 22 | 24 | 26 | | | |
| | | US gal/h | 3,2 | 3,9 | 5,0 | 5,5 | 5,7 | 6,2 | 6,9 | | | |

| Intake and exhaust system | Rating | r/min | 1000 | 1200 | 1500 | 1800 | 1900 | 2100 | 2300 | | | | |
|---|--------|---------------------|------|------|------|------|------|------|------|-----|-----|--|--|
| Specific exhaust heating effect in percent of crankshaft power | 1 | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| Exhaust temperature (at the exhaust pipe connecting flange after the turbo charger?) | 1 | °C | 430 | 440 | 410 | 370 | 360 | 345 | 335 | | | | |
| | | °F | 806 | 824 | 770 | 698 | 680 | 653 | 635 | | | | |
| Permitted back pressure in the exhaust line at rated speed. (Installed back pressure) | | kPa | | | | | | | | Max | 5,7 | | |
| | | psi | | | | | | | | | 0,8 | | |
| Engine air consumption at 25°C / 77°F atmospheric pressure 100kPa and relative humidity 30% | 1 | m ³ /min | | | 5,7 | 6,7 | 8 | 8,5 | 9,3 | | | | |
| | | cu.ft./min | | | 201 | 237 | 283 | 300 | 328 | | | | |
| Exhaust gas flow (behind turbine) | 1 | m ³ /min | | | 14,7 | 18,3 | 18,8 | 20,5 | 21,7 | | | | |
| | | cu.ft./min | | | 518 | 647 | 665 | 724 | 765 | | | | |

| Cooling system | Rating | r/min | 1000 | 1200 | 1500 | 1800 | 1900 | 2100 | 2300 | | | | |
|--|--------|----------------------------|------|------|-------|-------|-------|-------|-------|-----------|--|--|--|
| Radiated heat in percent of crankshaft power. | 1 | % | | | | | | | | | | | |
| | 1 | % | | | 19 | 22 | 23 | 25 | 26 | | | | |
| Cooling water heating effect incl. oil cooler in percent of crankshaft power 3). | 1 | % | | | 61 | 68 | 71 | 78 | 86 | | | | |
| | 1 | % | | | | | | | | | | | |
| Highest permissible pressure drop in outer circuit at keel cooling. | | kPa In H ₂ O | | | | | | | | 50 201 | | | |
| Sea water pump flow. | | l/min | | | 110,0 | 130,0 | 135,0 | 145,0 | 160,0 | | | | |
| | | cu.ft./min | | | 3,9 | 4,6 | 4,8 | 5,1 | 5,7 | | | | |
| Cooling water circulation pump flow | | l/min | | | 120,0 | 140,0 | 145,0 | 155,0 | 170,0 | | | | |
| | | cu.ft./min | | | 4,2 | 4,9 | 5,1 | 5,5 | 6,0 | | | | |
| Max permissible temperature on fresh water circulation outlet from the engine | | °C | | | | | | | | 105 | | | |
| | | °F | | | | | | | | 221 | | | |
| Coolant volyme in engine with raw water. | | litres | | | | | | | | 21 | | | |
| | | U.S. gal. | | | | | | | | 5,55 | | | |
| Thermostat, start open at | | °C | | | | | | | | 87 | | | |
| | | °F | | | | | | | | 189 | | | |
| Thermostat, fully open at | | °C | | | | | | | | 102 | | | |
| | | °F | | | | | | | | 216 | | | |

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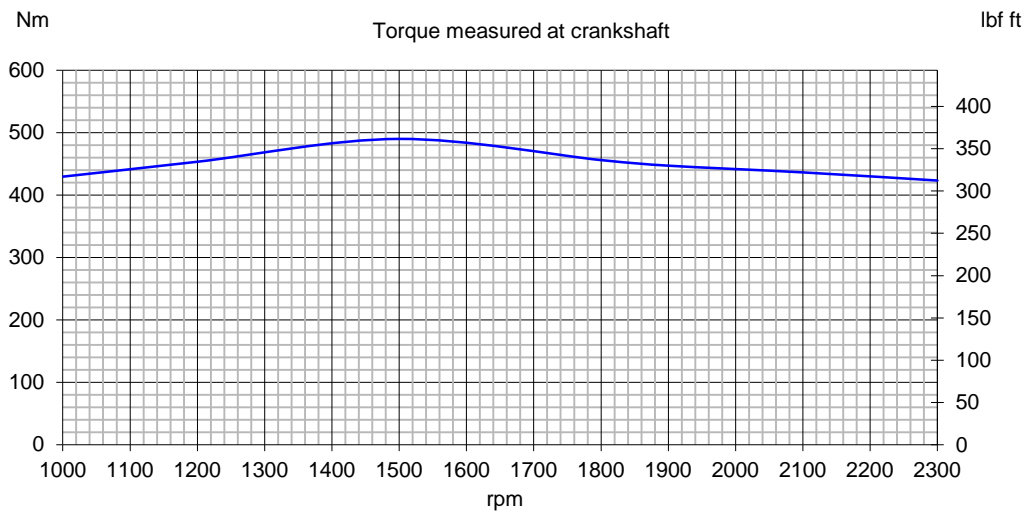
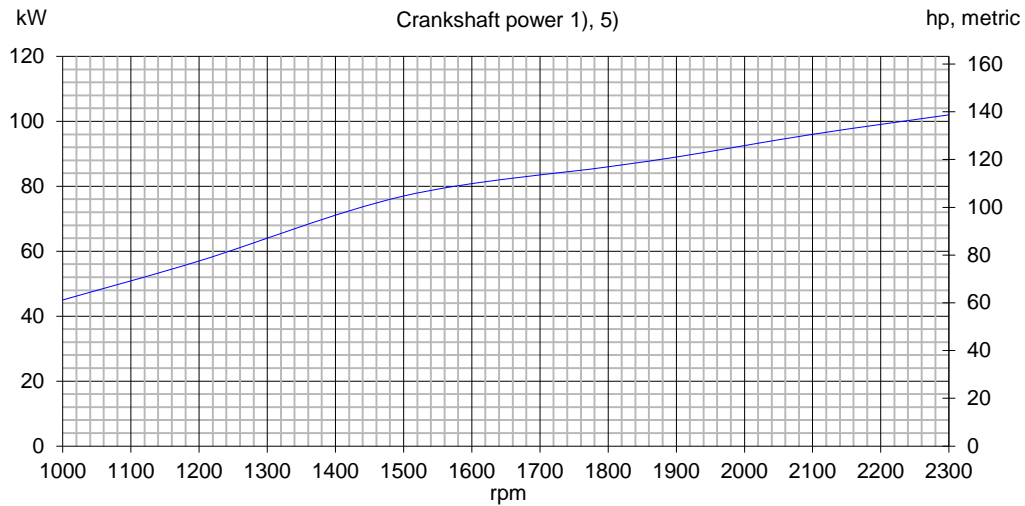
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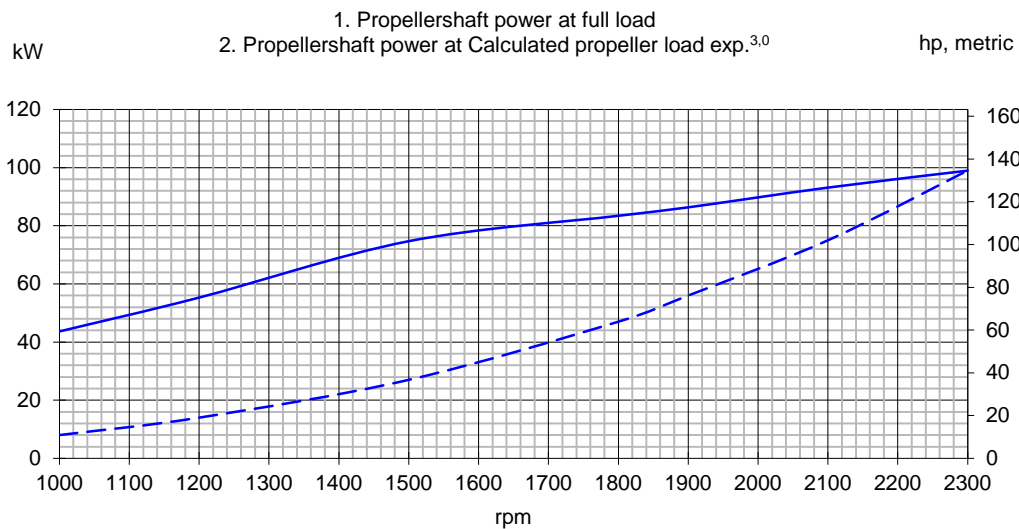
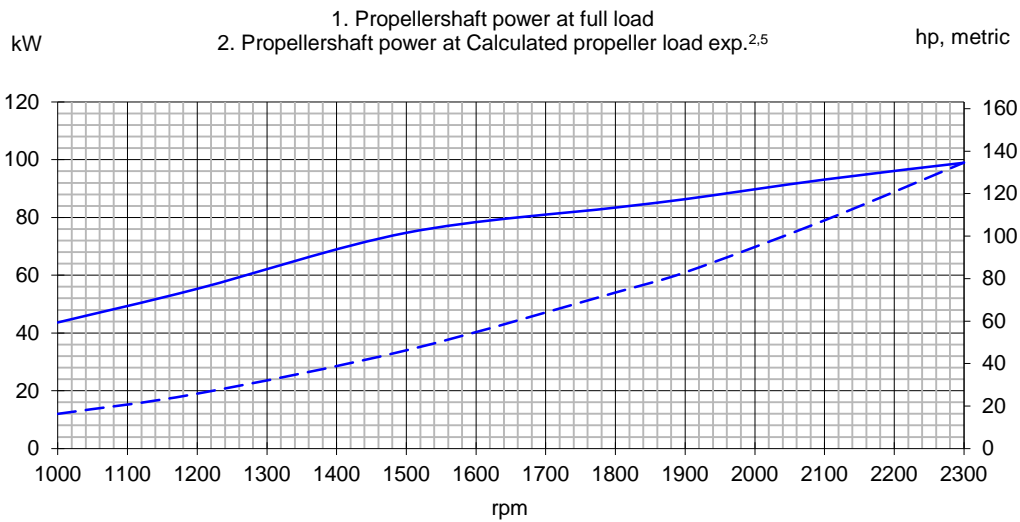
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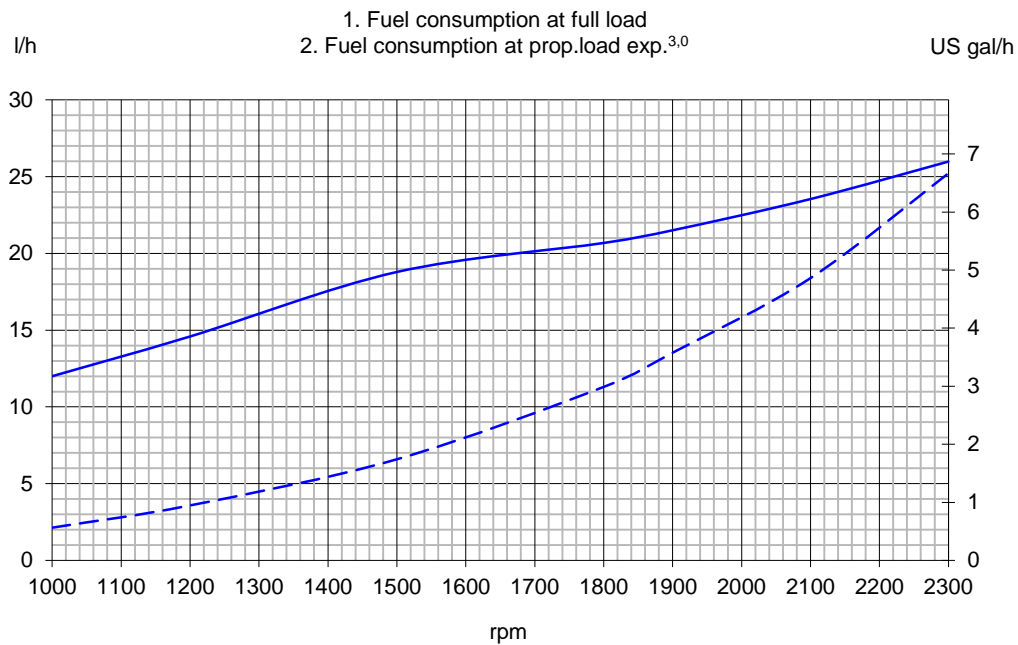
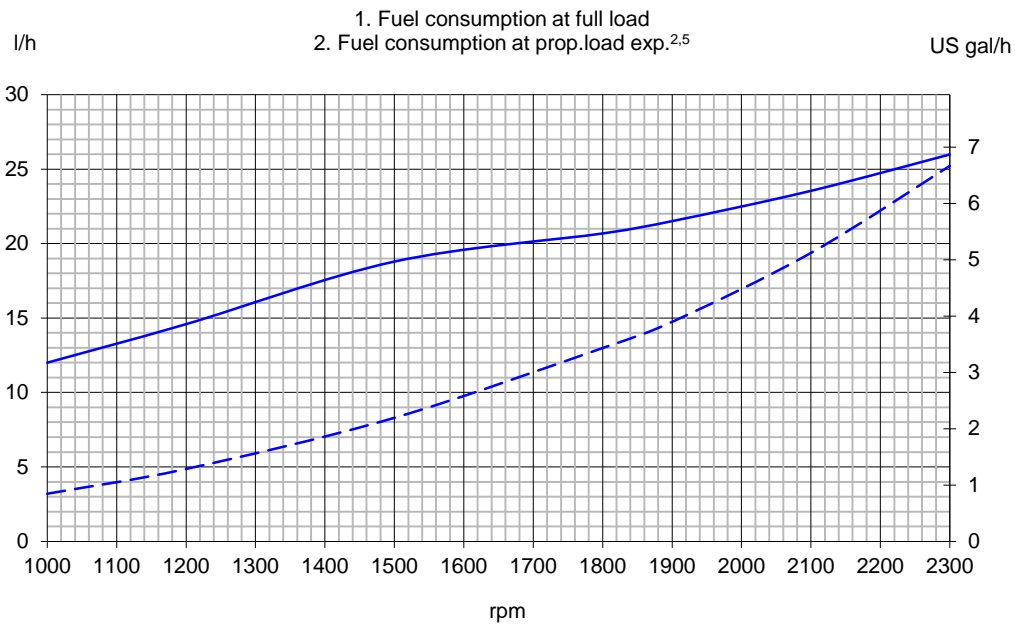
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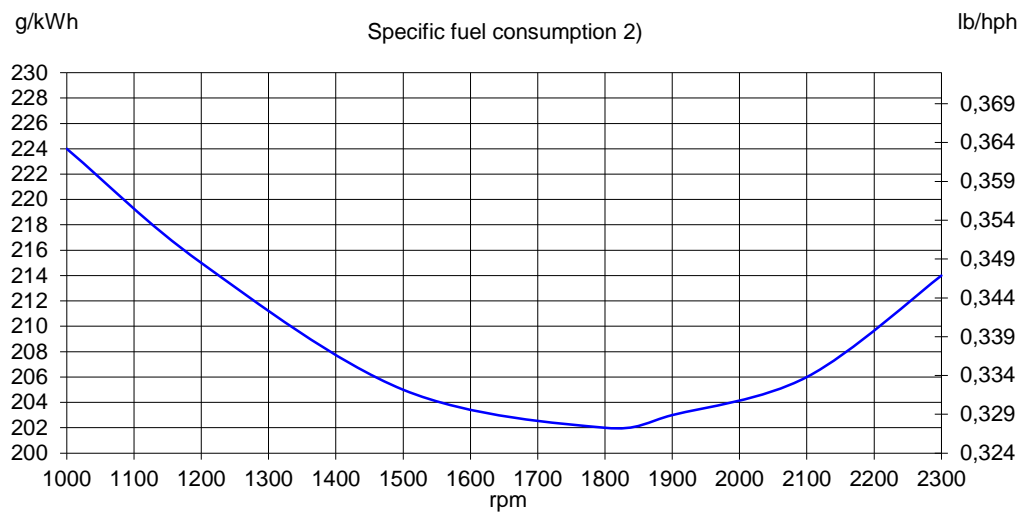
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