

Technical Data D1-30

Rating

General

4-stroke in-direct injected, diesel engine

| | | |
|--|---------------------------|--------------|
| Number of cylinders | | 3 |
| No of valves | | 6 |
| Displacement, total | litres in ³ | 1,13 69,1 |
| Firing order | | 1-2-3 |
| Rotational direction, viewed from the front | | Clockwise |
| Bore | mm in | 77 3,03 |
| Stroke | mm in | 81 3,19 |
| Compression ratio | | 23,5:1 |
| Compression pressure at 240 rpm | MPa psi | |
| Maximum forward inclination: | ° | 0 |
| Max. intermittent backward tilt while running: | ° | 25 |
| Max. intermittent side tilt while running: | ° | 35 |
| Idling speed | rpm | 850 ± 25 |
| Rated speed | rpm | 3200 |
| Propeller selection range | rpm | 2800-3200 |
| Dry weight engine BT | kg lb | 127 280 |

| Performance | | Rating | r/min | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
|--|--|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Crankshaft power 1), 5) | | kW | 7,5 | 9,5 | 11,2 | 12,8 | 14,7 | 16,4 | 17,8 | 18,5 | 19,3 | 20 | 20,9 | |
| | | hp | 10,2 | 12,92 | 15,23 | 17,41 | 19,99 | 22,3 | 24,21 | 25,16 | 26,25 | 27,2 | 28,42 | |
| Propeller shaft power 1) (At full load) | | kW | 7,2 | 9,12 | 10,75 | 12,29 | 14,11 | 15,74 | 17,09 | 17,76 | 18,53 | 19,2 | 20,06 | |
| | | hp | 9,792 | 12,4 | 14,62 | 16,71 | 19,19 | 21,41 | 23,24 | 24,15 | 25,2 | 26,11 | 27,29 | |
| Propellershaft power at prop.load x ³ | | kW | 1,1 | 1,7 | 2,5 | 3,6 | 4,9 | 6,5 | 8,5 | 10,8 | 13,5 | 16,6 | 20,1 | |
| | | hp | 1,4 | 2,3 | 3,4 | 4,9 | 6,7 | 8,9 | 11,5 | 14,7 | 18,3 | 22,5 | 27,3 | |
| Torque at crankshaft 2) | | Nm | 59,68 | 64,8 | 66,85 | 67,91 | 70,19 | 71,19 | 70,82 | 67,95 | 65,82 | 63,66 | 62,37 | |
| | | lbf ft | 44 | 48 | 49 | 50 | 52 | 53 | 52 | 50 | 49 | 47 | 46 | |
| Mean piston speed | | m/s | 3,2 | 3,8 | 4,3 | 4,9 | 5,4 | 5,9 | 6,5 | 7,0 | 7,6 | 8,1 | 8,6 | |
| | | ft/s | 10,6 | 12,4 | 14,2 | 15,9 | 17,7 | 19,5 | 21,3 | 23,0 | 24,8 | 26,6 | 28,3 | |
| Effective mean pressure 2) | | MPa | 0,66 | 0,72 | 0,74 | 0,75 | 0,78 | 0,79 | 0,79 | 0,75 | 0,73 | 0,71 | 0,69 | |
| | | psi | 96,1 | 104,4 | 107,7 | 109,4 | 113,1 | 114,7 | 114,1 | 109,4 | 106,0 | 102,5 | 100,5 | |

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

Technical Data D1-30

Rating

Lubricating system

| | | | | | | | | | | | | | |
|--|--|--------|------|--|--|--|--|--|--|--|--|--|--|
| Max oil volume excl. filters at following inclination: | | litres | 3,5 | | | | | | | | | | |
| | | US gal | 0,92 | | | | | | | | | | |

Fuel system

| | Rating | r/min | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
|---|--------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Specific fuel consumption 2) | | g/kWh | 275 | 266 | 260 | 258 | 257 | 257 | 258 | 260 | 261 | 264 | 270 |
| | | lb/hph | 0,446 | 0,431 | 0,421 | 0,418 | 0,416 | 0,416 | 0,418 | 0,421 | 0,423 | 0,428 | 0,437 |
| Fuel consumption at prop. load x ³ | | l/h | 0,8 | 1,0 | 0,9 | 1,5 | 1,9 | 2,4 | 2,9 | 3,6 | 4,4 | 5,5 | 6,7 |
| | | US gal/h | 0,2 | 0,3 | 0,2 | 0,4 | 0,5 | 0,6 | 0,8 | 0,9 | 1,2 | 1,5 | 1,8 |
| Fuel consumption at full load | | l/h | 2,5 | 3,0 | 3,5 | 4,0 | 4,5 | 5,0 | 5,5 | 5,8 | 6,0 | 6,3 | 6,8 |
| | | US gal/h | 0,7 | 0,8 | 0,9 | 1,0 | 1,2 | 1,3 | 1,5 | 1,5 | 1,6 | 1,7 | 1,8 |

Intake and exhaust system

| | Rating | r/min | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | |
|--|--------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| Exhaust temperature at the exhaust pipe connecting flange after the turbo charger. | | °C | 407 | 441 | 463 | 476 | 507 | 530 | 523 | 540 | 537 | 522 | 511 | |
| | | °F | 765 | 826 | 865 | 889 | 945 | 986 | 973 | 1004 | 999 | 972 | 952 | |
| Permitted back pressure in the exhaust line at rated speed. (Installed back pressure) | | kPa | | | | | | | | Max | 20 | | | |
| | | psi | | | | | | | | | 2,9 | | | |
| | | kPa | | | | | | | | Min | | | | |
| | | psi | | | | | | | | | | | | |
| Engine air consumption at 25°C / 77°F atmospheric pressure 100kPa and relative humidity 30%. | | m³/min | 0,567 | 0,667 | 0,75 | 0,833 | 0,917 | 1 | 1,117 | 1,167 | 1,25 | 1,35 | 1,45 | |
| | | cu.ft./min | 20,01 | 23,54 | 26,49 | 29,43 | 32,37 | 35,31 | 39,43 | 41,2 | 44,14 | 47,67 | 51,21 | |
| Exhaust gas flow | | m³/min | 1,45 | 1,75 | 2,017 | 2,267 | 2,567 | 2,817 | 3,067 | 3,217 | 3,4 | 3,55 | 3,65 | |
| | | cu.ft./min | 51,21 | 61,8 | 71,22 | 80,05 | 90,64 | 99,47 | 108,3 | 113,6 | 120,1 | 125,4 | 128,9 | |

Cooling system

| | Rating | r/min | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
|---|--------|---------------------|------|------|------|------|------|------|------|------|------|------|------|
| Radiated heat in percent of crankshaft power. | | % | 13 | 12 | 12 | 13 | 14 | 14 | 13 | 12 | 14 | 16 | 16 |
| | | | | | | | | | | | | | |
| Coolant heat rejection to HE, excl. oil- and aftercooler, in percent of crankshaft power. | | % | 138 | 128 | 122 | 116 | 112 | 111 | 110 | 113 | 112 | 113 | 117 |
| | | | | | | | | | | | | | |
| Available pumphead of freshwater circulation pump. At least 70% must be utilized to get turbulent flow. | | kPa | 27,2 | 32,1 | 37 | 41,8 | 46,8 | 51,7 | 56,6 | 61,6 | 66,7 | 71,7 | 76,5 |
| | | In H ₂ O | 109 | 129 | 149 | 168 | 188 | 208 | 227 | 247 | 268 | 288 | 307 |
| Sea water pump flow. | | m³/h | 1,1 | 1,2 | 1,3 | 1,3 | 1,4 | 1,6 | 1,7 | 1,8 | 2,0 | 2,1 | 2,2 |
| | | foot³/h | 39 | 43 | 47 | 46 | 50 | 55 | 60 | 65 | 69 | 73 | 77 |
| Fresh water circulation pump flow | | m³/h | 1,6 | 1,9 | 2,2 | 2,5 | 2,8 | 3,1 | 3,4 | 3,7 | 4,0 | 4,3 | 4,6 |
| | | foot³/h | 58 | 68 | 78 | 89 | 99 | 110 | 120 | 131 | 141 | 152 | 162 |
| Max permissible temperature on fresh water circulation outlet from the engine | | °C | 105 | | | | | | | | | | |
| | | °F | 221 | | | | | | | | | | |
| Coolant content engine, incl. heat exchangers and air cooler | | litres | 4,1 | | | | | | | | | | |
| | | U.S. gal. | 1,08 | | | | | | | | | | |

Emissions

| | Rating | r/min | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
|------------------------------------|--------|-------|------|------|------|------|------|------|------|------|------|------|------|
| Smoke at prop. load x ³ | | *BSU | 0,2 | 0,3 | 0,4 | 0,3 | 0,3 | 0,4 | 0,6 | 0,6 | 1,4 | 1,5 | 1,4 |

*NB.! BSU are calculated values. Measured values are acc. to ISO 10054 in FSN units

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