

|  |                 |             |
|--|-----------------|-------------|
| <b>VOLVO PENTA</b><br>D6-330 I<br>R4 330 hp (243 kW) | Document No     | Issue Index |
|  | <b>21954802</b> | <b>02</b>   |

### General

4-stroke direct injected, turbocharged and aftercooled diesel engine

|   |                 |                   |
|---|-----------------|-------------------|
| Number of cylinders                                   |                 | 6                 |
| No of valves  |                 | 24                |
| Displacement, total                                   | litres          | 5,50              |
|   | in <sup>3</sup> | 335,6             |
| Firing order  |                 | 1-5-3-6-2-4       |
| Rotational direction, viewed from the front           |                 | Clockwise         |
| Bore  | mm              | 103               |
|   | in              | 4,06              |
| Stroke  | mm              | 110               |
|   | in              | 4,33              |
| Compression ratio                                     |                 | 17.5:1            |
| Compression pressure at 240 rpm                       | MPa<br>psi      |                   |
| Max. static forward inclination:                      | °               | 0                 |
| Max. static backward inclination:                     | °               | 10                |
| Max. intermittent forward inclination while running:  | °               | 10                |
| Max. intermittent backward inclination while running: | °               | 20                |
| Max. intermittent side inclination while running:     | °               | 30 for max 30 sec |
| Idling speed  | rpm             | 600 - 650         |
| Rated speed R4  | rpm             | 3500              |
| Propeller selection range R4                          | rpm             | 3400-3600         |
| Dry weight engine BT                                  | kg              | 580               |
|   | lb              | 1279              |
| Dry weight with reverse gear HS63AE                   | kg              | 656               |
|   | lb              | 1446              |
| Dry weight with reverse gear HS80AE                   | kg              | 677               |
|   | lb              | 1493              |
| Dry weight with reverse gear HS80VE                   | kg              | 721               |
|   | lb              | 1590              |

| Performance   | Rating | rpm    | 1000  | 1500  | 2000  | 2500  | 3000  | 3500  |  |  |  |  |
|---|--------|--------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Crankshaft power 1), 5)                             | 4      | kW     | 47    | 99    | 169   | 212   | 241   | 243   |  |  |  |  |
|   |        | hp     | 64    | 135   | 230   | 289   | 328   | 330   |  |  |  |  |
| Propeller shaft power 1) (At full load)             | 4      | kW     | 45    | 95    | 163   | 204   | 231   | 233   |  |  |  |  |
|   |        | hp     | 61    | 129   | 221   | 277   | 315   | 317   |  |  |  |  |
| With reverse gear HS80AE                            | 4      | kW     | 45    | 94    | 161   | 202   | 229   | 231   |  |  |  |  |
|   |        | hp     | 61    | 128   | 219   | 274   | 311   | 314   |  |  |  |  |
| With reverse gear HS80VE                            | 4      | kW     | 46    | 97    | 165   | 207   | 235   | 237   |  |  |  |  |
|   |        | hp     | 62    | 132   | 225   | 282   | 320   | 323   |  |  |  |  |
| With reverse gear HS63AE                            | 4      | kW     | 10    | 28    | 58    | 101   | 159   | 233   |  |  |  |  |
|   |        | hp     | 14    | 38    | 78    | 137   | 216   | 317   |  |  |  |  |
| Propellershaft power at prop. load x <sup>2.5</sup> | 4      | kW     | 10    | 28    | 57    | 100   | 157   | 231   |  |  |  |  |
|   |        | hp     | 14    | 38    | 77    | 135   | 214   | 314   |  |  |  |  |
| With reverse gear HS80AE                            | 4      | kW     | 10    | 29    | 59    | 102   | 161   | 237   |  |  |  |  |
|   |        | hp     | 14    | 39    | 80    | 139   | 219   | 323   |  |  |  |  |
| With reverse gear HS80VE                            | 4      | kW     | 5     | 18    | 44    | 85    | 147   | 233   |  |  |  |  |
|   |        | hp     | 7     | 25    | 59    | 116   | 200   | 317   |  |  |  |  |
| With reverse gear HS80VE                            | 4      | kW     | 5     | 18    | 43    | 84    | 145   | 231   |  |  |  |  |
|   |        | hp     | 7     | 25    | 59    | 114   | 198   | 314   |  |  |  |  |
| With reverse gear HS63AE                            | 4      | kW     | 6     | 19    | 44    | 86    | 149   | 237   |  |  |  |  |
|   |        | hp     | 8     | 25    | 60    | 118   | 203   | 323   |  |  |  |  |
| Torque at crankshaft 2)                             | 4      | Nm     | 448,8 | 630,9 | 808,3 | 810,5 | 767,1 | 663   |  |  |  |  |
|   |        | lbf ft | 331   | 465   | 596   | 598   | 566   | 489   |  |  |  |  |
| Mean piston speed                                   |        | m/s    | 3,7   | 5,5   | 7,3   | 9,2   | 11,0  | 12,8  |  |  |  |  |
|   |        | ft/s   | 12,0  | 18,0  | 24,1  | 30,1  | 36,1  | 42,1  |  |  |  |  |
| Effective mean pressure 2)                          | 4      | MPa    | 1,03  | 1,44  | 1,85  | 1,85  | 1,75  | 1,51  |  |  |  |  |
|   |        | psi    | 148,7 | 209,1 | 267,9 | 268,6 | 254,2 | 219,7 |  |  |  |  |
| Max combustion pressure 2)                          | 4      | MPa    | 11    | 13    | 15    | 16    | 16    | 16    |  |  |  |  |
|   |        | psi    | 1595  | 1885  | 2176  | 2321  | 2321  | 2321  |  |  |  |  |

### Lubricating system

|  |        |       |
|--|--------|-------|
| Specific lubricating oil consumption.  | g/kWh  | < 0,2 |
| Max. oil volume including filters for all allowed installation inclinations: | litres | 20    |
|  | US gal | 5,28  |
| Min. oil volume excluding filters for all allowed installation inclinations: | litres | 15    |
|  | US gal | 3,96  |

### Fuel system

|   | Rating | rpm      | 1000  | 1500  | 2000  | 2500 | 3000  | 3500  |  |  |  |  |
|---|--------|----------|-------|-------|-------|------|-------|-------|--|--|--|--|
| Specific fuel consumption 2)                    | 4      | g/kWh    | 244   | 237   | 213   | 204  | 215   | 235   |  |  |  |  |
|   |        | lb/hph   | 0,395 | 0,384 | 0,345 | 0,33 | 0,348 | 0,381 |  |  |  |  |
| Fuel consumption, Test cycle E5                 | 4      | g/kWh    | 235   |       |       |      |       |       |  |  |  |  |
|   |        | lb/hph   | 0,38  |       |       |      |       |       |  |  |  |  |
| Fuel consumption at prop. load x <sup>2.5</sup> | 4      | l/h      | 3,4   | 8,0   | 15,9  | 27,5 | 44,9  | 68,3  |  |  |  |  |
|   |        | US gal/h | 0,9   | 2,1   | 4,2   | 7,3  | 11,9  | 18,1  |  |  |  |  |
| Fuel consumption at prop. load x <sup>3</sup>   | 4      | l/h      | 2,4   | 5,8   | 12,6  | 23,7 | 41,4  | 68,3  |  |  |  |  |
|   |        | US gal/h | 0,6   | 1,5   | 3,3   | 6,3  | 10,9  | 18,1  |  |  |  |  |
| Fuel consumption at full load                   | 4      | l/h      | 13,7  | 28,1  | 43,2  | 51,8 | 62,0  | 68,3  |  |  |  |  |
|   |        | US gal/h | 3,6   | 7,4   | 11,4  | 13,7 | 16,4  | 18,1  |  |  |  |  |

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| <b>Intake and exhaust system</b>   | <b>Rating</b> | <b>rpm</b>           | <b>1000</b> | <b>1500</b> | <b>2000</b> | <b>2500</b> | <b>3000</b> | <b>3500</b>   |     |           |  |  |
|--|---------------|----------------------|-------------|-------------|-------------|-------------|-------------|---------------|-----|-----------|--|--|
| Specific exhaust heating effect in percent of crankshaft power                               | 4             | %                    |             |             |             |             |             | 68            |     |           |  |  |
| Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.           | 4             | °C<br>°F             | 160<br>320  | 230<br>446  | 310<br>590  | 355<br>671  | 405<br>761  | 495<br>923    |     |           |  |  |
| Permitted back pressure in the exhaust line at rated speed.<br>(Installed back pressure)     |               | kPa<br>psi           |             |             |             |             |             |               | Max | 30<br>4,4 |  |  |
|  |               | kPa<br>psi           |             |             |             |             |             |               | Min | 10<br>1,5 |  |  |
| Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%. | 4             | m³/min<br>cu.ft./min |             |             |             |             |             | 22,5<br>794,6 |     |           |  |  |
| Charge air pressure<br>Inlet manifold  | 4             | kPa<br>psi           |             |             |             |             |             | 190<br>27,6   |     |           |  |  |
| Exhaust gas flow   | 4             | m³/min<br>cu.ft./min |             |             |             |             |             | 41,2<br>1455  |     |           |  |  |

| <b>Cooling system</b>  | <b>Rating</b> | <b>rpm</b>          | <b>1000</b> | <b>1500</b> | <b>2000</b> | <b>2500</b> | <b>3000</b> | <b>3500</b> |      |  |  |  |
|--|---------------|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|------|--|--|--|
| Radiated heat in percent of crankshaft power.  | 4             | %                   |             |             |             |             |             | 2           |      |  |  |  |
| Heat rejection to charge air cooler in percent of crankshaft power.  | 4             | %                   |             |             |             |             |             | 29          |      |  |  |  |
| Coolant heat rejection to HE, incl. engine oil cooler and excl. charge air cooler, in percent of crankshaft power. | 4             | %                   |             |             |             |             |             | 83          |      |  |  |  |
|  |               |                     |             |             |             |             |             |             |      |  |  |  |
| Coolant flow with fully open thermostat and std cooling system   |               | l/min<br>cu.ft./min |             |             |             |             |             | 360<br>12,7 |      |  |  |  |
| Extra water pump flow through charge air cooler  |               | l/min<br>cu.ft./min |             |             |             |             |             | 215<br>7,6  |      |  |  |  |
| Max. permissible temperature on coolant in engine outlet   |               | °C                  |             |             |             |             |             |             | 55   |  |  |  |
|  |               | °F                  |             |             |             |             |             |             | 131  |  |  |  |
| Coolant volume engine, including heat exchanger and charge air cooler  |               | litres              |             |             |             |             |             |             | 16   |  |  |  |
|  |               | US gal.             |             |             |             |             |             |             | 4,23 |  |  |  |
| Max. additional coolant for cabin heater etc. with std. Expansion tank   |               | litres              |             |             |             |             |             |             | 5    |  |  |  |
|  |               | US gal.             |             |             |             |             |             |             | 1,32 |  |  |  |
| Maximum coolant flow to cabin heater etc.  |               | l/min               |             |             |             |             |             |             | 30   |  |  |  |
|  |               | cu.ft./min          |             |             |             |             |             |             | 1,06 |  |  |  |
| Thermostat, start open at  |               | °C                  |             |             |             |             |             |             | 82   |  |  |  |
|  |               | °F                  |             |             |             |             |             |             | 180  |  |  |  |
| Thermostat, fully open at  |               | °C                  |             |             |             |             |             |             | 92   |  |  |  |
|  |               | °F                  |             |             |             |             |             |             | 198  |  |  |  |

| <b>Raw water circuit</b>                              |  | <b>rpm</b> | <b>1000</b> | <b>1500</b> | <b>2000</b> | <b>2500</b> | <b>3000</b> | <b>3500</b> |    |  |  |  |
|---|--|------------|-------------|-------------|-------------|-------------|-------------|-------------|----|--|--|--|
| Nominal raw water design flow                         |  | l/min      |             |             |             |             |             | 215         |    |  |  |  |
|   |  | cu.ft./min |             |             |             |             |             | 7,6         |    |  |  |  |
| Maximum raw water temperature entering heat exchanger |  | °C         |             |             |             |             |             |             | 30 |  |  |  |
|   |  | °F         |             |             |             |             |             |             | 86 |  |  |  |

| <b>Emissions</b>                     | <b>Rating</b> | <b>rpm</b> | <b>1000</b> | <b>1500</b> | <b>2000</b> | <b>2500</b> | <b>3000</b> | <b>3500</b> |  |  |  |  |
|--------------------------------------|---------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|--|--|--|--|
| Smoke at prop. load x <sup>2,5</sup> | 4             | *BSU       | 0,6         | 0,4         | 0,3         | 0,2         | 0,3         | 0,6         |  |  |  |  |
| Smoke at prop. load x <sup>3</sup>   | 4             | *BSU       | 0,5         | 0,4         | 0,3         | 0,3         | 0,3         | 0,6         |  |  |  |  |

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