

<b>VOLVO PENTA</b> D13B-C MP R4 800hp (IPS1050)	Document No	Issue Index
	<b>21410454</b>	<b>03</b>

## General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		6
No of valves		24
Displacement, total	litres in <sup>3</sup>	12,78 779,7
Firing order		1-5-3-6-2-4
Rotational direction, viewed from the front		Clockwise
Bore	mm in	131 5,16
Stroke	mm in	158 6,22
Compression ratio		16,5:1
Max. static forward inclination:	°	0
Max. static backward inclination:	°	10
Max. intermittent forward inclination while running:	°	5
Max. intermittent backward inclination while running:	°	17
Max. intermittent side inclination while running:	°	30
Idling speed	rpm	600 ± 50
Rated speed R4	rpm	2300
Propeller selection range R4	rpm	2250-2370
Dry weight engine BT	kg lb	1560 3439

Performance	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Crankshaft power 1), 5)	4	kW	87	246	307	338	399	461	553	588	588	588
		hp	118	335	418	460	543	627	752	800	800	800
Propeller shaft power 1) (At full load) With drive	4	kW	84	236	295	324	383	443	531	564	564	564
		hp	114	321	401	441	521	602	722	768	768	768
Propellershaft power at prop. load x <sup>2,5</sup>	4	kW	20	40	70	89	136	194	306	398	450	564
		hp	27	55	96	121	184	264	416	541	612	768
Torque at crankshaft 2)	4	Nm	1385	2936	2932	2934	2931	2935	2934	2807	2674	2441
		lbf ft	1021	2166	2162	2164	2162	2165	2164	2071	1972	1801
Mean piston speed		m/s	3,2	4,2	5,3	5,8	6,8	7,9	9,5	10,5	11,1	12,1
		ft/s	10,4	13,8	17,3	19,0	22,5	25,9	31,1	34,6	36,3	39,7
Effective mean pressure 2)	4	MPa	1,36	2,89	2,88	2,89	2,88	2,89	2,89	2,76	2,63	2,40
		psi	197,5	418,9	418,2	418,5	418,1	418,6	418,5	400,5	381,4	348,2
Max combustion pressure 2)	4	MPa	11,6	19,8	19	19	18,8	18,7	19	18,9	18,5	18,2
		psi	1682	2872	2756	2756	2727	2712	2756	2741	2683	2640

## Lubricating system

Specific lubricating oil consumption.	g/kWh	0,05
Max. oil volume including filters for all allowed installation inclinations:	litres	45
	US gal	11,89
Max. oil volume excluding filters for all allowed installation inclinations:	litres	40
	US gal	10,57
Min. oil volume excluding filters for all allowed installation inclinations:	litres	32
	US gal	8,45

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

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Fuel system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Specific fuel consumption 2)	4	g/kWh lb/hph	235 0,381	205 0,332	194 0,314	194 0,314	197 0,319	200 0,324	204 0,33	205 0,332	205 0,332	210 0,34
Fuel consumption at Test cycle?	4	g/kWh lb/hph	212 0,34									
Fuel consumption at prop. load x <sup>2.5</sup>	4	l/h US gal/h	6,1 1,6	11,3 3,0	18,6 4,9	23,0 6,1	33,6 8,9	48,3 12,8	77,0 20,3	101,2 26,7	115,1 30,4	147,8 39,0

Fuel system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Fuel consumption at full load	4	l/h US gal/h	24,5 6,5	60,3 15,9	71,3 18,8	78,5 20,7	94,1 24,8	110,3 29,1	135,0 35,7	144,2 38,1	144,2 38,1	147,8 39,0

Intake and exhaust system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300	
Specific exhaust heating effect in percent of crankshaft power	4	%	64	70	75	71	66	63	68	73	76	80	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	4	°C °F	480 896	475 887	425 797	430 806	475 887	505 941	510 950	500 932	480 896	470 878	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi kPa psi							Max Min	15 2,2			

Intake and exhaust system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	4	m³/min cu.ft./min m³/min cu.ft./min	5 170	14 487	19 682	22 763	25 886	29 1014	36 1271	40 1413	41 1458	45 1589
Charge air pressure Inlet manifold	4	kPa psi	40 5,8	205 29,7	250 36,3	255 37,0	255 37,0	265 38,4	290 42,1	305 44,2	305 44,2	315 45,7
Exhaust gas flow	4	m³/min cu.ft./min	14 480	38 1324	48 1681	54 1893	65 2306	77 2702	94 3302	101 3567	102 3602	107 3779

Cooling system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Radiated heat in percent of crankshaft power.	4	%	17	20	6	5	4	5	6	5	5	6
Coolant heat rejection to HE, incl. engine oil cooler and charge air cooler, in percent of crankshaft power.	4	%	106	86	73	67	63	63	68	70	71	72
Max. permissible temperature on coolant in engine outlet		°C °F	98 208									
Coolant volume engine, including heat exchanger and charge air cooler		litres US gal.	57 15,06									
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres US gal.	15 3,96									
Maximum coolant flow to cabin heater etc.		l/min cu.ft./min	40 1,41									
Thermostat, start open at		°C °F	82 180									
Thermostat, fully open at		°C °F	92 198									

Raw water circuit	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Nominal raw water design flow	l/min cu.ft./min	190 6,7	230 8,1	270 9,5	290 10,2	342 12,1	387 13,7	430 15,2	438 15,5	428 15,1	415 14,7
Maximum raw water pump suction head	kPa psi	30 4,4									
Maximum raw water temperature entering heat exchanger	°C °F	32 90									

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Emissions	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Smoke at prop. load $x^{2.5}$	4	*BSU	0,1	0,2	0,2	0,3	0,2	0,3	0,2	0,2	0,2	0,3
Smoke at prop. load $x^3$	4	*BSU	0,1	0,1	0,1	0,2	0,2	0,2	0,1	0,2	0,2	0,3
Noise at prop. load $x^{2.5}$ . 4)	4	dBA	100,2	107,6	108,4	108	107,8	109,4	111,6	113,6	114,6	115,7
Noise at prop. load $x^3$ . 4)	4	dBA	100	102,3	108,4	108,7	108,2	109,6	111,4	113,4	114,5	115,9

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

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